

that in the elucidation of the Permian climatological problems which have now become the climacteric ones, no appeal could be taken to a supposed final refrigeration, or to any declining stage or senile condition of the earth, and that hence all hypotheses which involve such features had been set aside by the advance of discovery. There appeared, therefore, no good reason for calling up specifically Manson's theory merely to say that it had been put out of court by the progress of geological inquiry, especially as the recital of the results of inquiry, and their necessary implications, had already told the tale for themselves.

T. C. CHAMBERLIN.

UNIVERSITY OF CHICAGO,
October 8, 1906.

CORRESPONDENCE RELATING TO THE SURVEY OF
THE COAL FIELDS OF ARKANSAS.

TO THE EDITOR OF SCIENCE: I enclose herewith copies of the correspondence between the Director of the U. S. Geological Survey and myself regarding a matter of far-reaching importance to the geologists and other scientific men of this country.

A word is necessary by way of introduction: I was state geologist of the state of Arkansas from 1887 to 1893. One of the first things undertaken by the survey under my direction was a report upon the coal fields of that state. The work was under the immediate direction of Arthur Winslow, a graduate of the Massachusetts Institute of Technology, for some years assistant of the Pennsylvania survey in the anthracite regions and later for several years state geologist of Missouri. Mr. Winslow was assisted by several competent men, among whom were Professor Gilbert D. Harris, now state geologist of Louisiana; Dr. C. E. Siebenthal, now assistant on the U. S. Geological Survey; H. E. Williams, until lately chief topographer of the S. Paulo Geological Survey in Brazil; J. H. Means, consulting geologist, London, England; and Dr. J. F. Newsom, now professor of economic geology in Stanford University. In 1888 a preliminary report on the coal was published, but the final report was completed later.

Owing partly to interruptions and delays that are here irrelevant and partly to lack of funds for the purpose, the final report on coal was not published up to the time I left Arkansas. Efforts were made from time to time to have the legislature provide for its publication, but it was never printed, in spite of the fact that it was economically the most important piece of work the state survey had done. Finally, in 1902, I suggested that the U. S. Geological Survey publish the report, and this was agreed to on condition that the maps of the coal region be reduced to a scale of two miles to the inch and that the contour interval be changed from twenty feet to fifty feet. To this I would not consent because the matter was one of too much importance to the people of Arkansas. Thereupon negotiations came to an end. Later I called the attention of U. S. Senator James P. Clarke, of Arkansas, to the importance of having this coal report brought up to date and published on a scale of a mile to the inch. Shortly afterwards I received the following letter from the director of the U. S. Geological Survey. The rest of the correspondence is self explanatory.

J. C. BRANNER.

U. S. GEOLOGICAL SURVEY.

WASHINGTON, D. C., Jan. 31, 1906.

DR. JOHN C. BRANNER,

Stanford University, Cal.

Dear Sir: There have recently been made several urgent requests by parties interested in the Arkansas coal field for a geological resurvey of that region. The persons making the request claim that since your survey of the field old workings have been extended, many new mines have been opened, and the region has been thoroughly prospected with the diamond drill. This development work has given more definite limits to the workable coals in areas heretofore mapped as coal-bearing, and has shown that workable beds occur in areas not hitherto recognized as containing coal. It is further urged that the coal of this region is becoming of such commercial importance that the United States Geological Survey should enter the field, assemble the data at hand, and make a very thorough and detailed survey of the region.

In view of the above conditions it seems desirable to take up this work in the near future.

Before doing so, however, I wish to lay the plans before you and ascertain if it is not possible to make some arrangement whereby the work done by you as state geologist of Arkansas can be utilized.

As a basis for practical cooperation the following plan is suggested,

1. That all notes and maps in your possession pertaining to the Arkansas coal field be turned over to this Survey for use in the proposed investigation;

2. That this material be used by the geologic parties so far as practicable in making a careful resurvey of the field, special attention being given to the economic features, and

3. That the results of this work be published by the United States Geological Survey in such form as may be decided upon, with the geology either shown upon the topographic base, upon the scale of 1:62500 as at present engraved, or on some reduced scale.

It will be understood that in all reports dealing with this region full credit shall be given to you and to the Arkansas Survey for the geologic material furnished by you and used in the resurvey, as well as for the topographic base maps prepared by this Survey under a plan of cooperation adopted in 1890.

Should this plan meet with your approval, kindly let me know at your earliest convenience, as preparations are being made for beginning field work in the early spring.

Very respectfully,

CHAS. D. WALCOTT,
Director.

(Sub-signature C. W. H.)

STANFORD UNIVERSITY, CAL.,
February 9, 1906.

HON. CHAS. D. WALCOTT,
Director of the U. S. Geological Survey.

Dear Sir: I have your letter of January 31 (C. W. H., M. R. C.) regarding a resurvey of the Arkansas coal fields. It goes without saying that I shall be glad to cooperate with the survey in this matter.

Having planned, directed and done a large part of the work in the coal regions of Arkansas, having carefully preserved and guarded the results of the survey since it was suspended, and having made several later trips to different parts of that region, I am naturally deeply interested in its geology and in the publication of the report.

After having done so much work upon it I feel that, by some sort of equity, I ought to be allowed to finish it. For that reason I venture

to suggest that the U. S. Geological Survey allot what you consider a reasonable sum for the completion of the work under contract with me. Such an arrangement would make it possible to finish the field work during the coming summer and to submit the completed report about March or April, 1907.

About two thousand five hundred square miles of geology should be gone over, and all openings made since 1889 should be examined, statistics gathered, and maps corrected to date.

As to the cost I suggest that the assistants whose judgment you rely upon in such matters be asked to make a just estimate of the probable cost of the work if done by some equally competent person with details warranting the publication of the maps on a scale of an inch to the mile, and that the amount so agreed upon be the price for which I should do the work. It should furthermore be understood that this price is to cover all expenses of field-work, supervision, preparation of the manuscript report, drawings, maps sections, photographs, etc., up to the submission of the report to the editor, and that the survey is to be called upon only for the necessary copies of the topographic maps now in its possession and for such analyses and coking and fuel value tests as may be necessary for the work.

Yours respectfully,

J. C. BRANNER.

U. S. GEOLOGICAL SURVEY.
WASHINGTON, D. C., Feb. 16, 1906.

DR. JOHN C. BRANNER,
Stanford University, Cal.

Sir: The plan of cooperation for the survey of the Arkansas coal field, which you propose in your favor of February 9, in answer to my letter of January 31, seems to differ in no essential particular from those that have been considered in the past and that have not proved acceptable to this bureau.

We have here a large force of men who have had wide experience for the last 10 or 15 years in coal work in various parts of the country, and also in connection with the Coal-Testing Plant at St. Louis, and we would not care to consider any proposition which would take the survey of the Arkansas coal field out of the control of these men.

The demands for a resurvey are so great that we feel compelled to enter the field, and, while the work done by you a number of years ago would doubtless be of some assistance to us, practically we expect to resurvey the entire region as though no previous surveys had been made. As

stated before, the only form of cooperation that is at all practicable is that proposed in my letter of January 31. This seems to be reasonable and just, and will give you full credit for all of the work that you have done, and for the maps of the region which you have prepared. Should you not be willing to accept this proposition, your material will be of little value, and there will be no hope of future publication.

We propose to send a party into the field on or about March 1, and if you feel inclined to accept our proposition, we shall be glad to hear from you at your earliest convenience so that the party may have the benefit of your material.

Very respectfully,

CHAS. D. WALCOTT,
Director.

(Sub-signatures M. R. C. and C. W. H.)

STANFORD UNIVERSITY, CAL.,
February 26, 1906.

HON. C. D. WALCOTT,
Director of the U. S. Geological Survey,
Washington, D. C.

Sir: I beg to resign my position as geologist of the United States Geological Survey.

The immediate reason for my resignation is that I consider the action of the survey as communicated in your letter of the sixteenth in regard to my work upon the coal regions of Arkansas as an outrage and an unwarranted personal affront to which no self-respecting geologist can tamely submit.

Respectfully yours,

J. C. BRANNER.

WASHINGTON, D. C., March 8, 1906.
DR. J. C. BRANNER,
Stanford University, Cal.

Dear Sir: Your letter of February 26, containing your resignation from the survey, is received. I sincerely regret that you have felt impelled to take this action. Certainly no outrage or affront was intended in my letter and I fail to understand the reasons for your position.

The field work of the Arkansas Survey in the coal districts was done, as I understand, about eighteen years ago. It was based upon topographic maps which are much below the present standard and which could not be published on the present scale without thorough revision, amounting in most cases practically to a complete resurvey.

It is no reflection upon that work or the geologists who were responsible for it to say that it does not come up to present standards, and, there-

fore, could not be accepted for publication by this survey. Moreover, the active development since the state survey work was done now makes a large amount of information available which was quite inaccessible in 1888, and any publication by this survey would be judged by present standards and in view of this new information. We have refrained from entering this field notwithstanding many urgent requests, in consideration of the fact that your final report remained unpublished. It now seems necessary to meet the demands for information which have become especially insistent since the results of the fuel-testing work at St. Louis have indicated new and important uses for this coal. Also several serious complaints have been made of specific errors in the map of the Arkansas coal fields published in the Twenty-second Annual, by which considerable losses have been occasioned.

A resurvey of the region being therefore necessary, it seemed to me that the work should be done by members of the regular survey force, from whom immediate results could be obtained and whose salaries must in any case be provided for. I was anxious to obtain your unpublished data, for which adequate payment would have been made and full credit given, both as a matter of justice to yourself and to avoid the duplication of so much of the work as could be utilized. I still think this is by far the best way in which this unpublished material can be utilized, but shall not urge your acceptance of the offer.

I shall hold your resignation for the present with the hope that you may be willing to reconsider the matter.

Very respectfully,

CHAS. D. WALCOTT,
Director.

(Sub-signature C. W. H.)

STANFORD UNIVERSITY, CAL.,
October 13, 1906.

HON. CHAS. D. WALCOTT,
Director of the U. S. Geological Survey,
Washington, D. C.

Sir: Your reply of March 8, last, to my proffered resignation was duly received. I have postponed answering your letter in the hope that time might enable me to see the wisdom and justice of your decision, and to feel less acutely the personal reflection upon myself and upon my assistants implied by the survey's action. Seven months have now passed since I received your letter of February 16, telling me that you would not consider any proposition that would leave me to finish my own work, and reminding me that

unless I turned over the data collected by me and by my assistants my 'material will be of little value, and there will be no hope of future publication.' In the meanwhile I have made every reasonable effort to get your point of view, to put myself in your place, and to find some excuse for a course of action on the part of the U. S. Geological Survey that, on the face of it, seems so unjust, especially as it discredits me not only in the eyes of my colleagues but in the estimation of the people of the state of Arkansas whom I have faithfully tried to serve.

To my great regret not only am I unable to find any just reason for your action in this case, but the more I have informed myself regarding the attitude of the survey toward individual workers in geology throughout the country the more have I been convinced that I can not remain a member of that organization.

Justice to myself requires that I say a word regarding the reasons for your course put forward in your letter of March 8. These reasons appear to be:

1. The field-work on the Arkansas coal region was done eighteen years ago.
2. It was based upon poor maps.
3. The work is not 'up to present standards,' and therefore could not be accepted for publication by the survey.
4. New uses for the coals have been found by the fuel-testing plant of the survey.
5. Losses have been caused by errors in a map of the Arkansas coal fields for which I am responsible.
6. The salaries of the regular assistants of the survey being provided for work must be given them.
7. You say: 'I was anxious to obtain your unpublished data, for which adequate payment would have been made and full credit given.'

Inasmuch as these are put forward as the real reasons for the survey's action in this case I beg to call to your attention the following facts:

1. It is fully recognized that the work was done so long ago that it needed to be brought up to date. Many new mines have been opened and much information is now available that was not available when the original work was done. But having originated and directed the survey of the Arkansas coal fields I hold that *it was altogether reasonable that I should be allowed to bring the report up to date, and if it needed correcting that I should be permitted to correct it.*

2. As for poor maps let me remind you that when my work was begun in the Arkansas coal

fields the maps of that region made by the U. S. Geological Survey were so poor that they were absolutely useless. The topography was shown with contour intervals of fifty feet, an interval so large that the characteristic features of the country were lost sight of, the land lines were not put on them at all, and the work had all the ear-marks of haste and indifference to the needs of the people. I was, therefore, obliged to remap the region on a scale of a mile to the inch with twenty-foot contour intervals. The maps made under my direction were based upon the land-office plats, and were necessarily cheap maps. But they were so much better than those made by the U. S. Geological Survey that the survey engraved them for me, and owns the original plates. If you have any doubt about the truth of these statements you only need compare the Fort Smith sheet of the U. S. Survey made in 1887 with the sheets of the same region made afterwards under my direction and engraved by the U. S. Survey. Under the circumstances reference to poor maps comes with bad grace from the director of the U. S. Geological Survey. The main weakness of the poor map excuse, however, is that nothing was said in our correspondence regarding topographic work. It was taken for granted that *if the topography needed revision it could be revised for me as well as for some one else.*

3. One would suppose that the statement that the work is not up to present standards was based upon some sort of knowledge of the report. As a matter of fact neither you nor any of your assistants have read the report, and you can not, therefore, know anything about its relation to standards of any kind. Moreover, even without reading it, *the U. S. Geological Survey offered to publish this same report in January, 1902, on condition that I should consent to the publication of the maps on a scale so small as to make them useless to the people of Arkansas.* One might suppose that it was up to standard in 1902 but had degenerated by 1906.

4. Referring to the new uses found for Arkansas coals by the fuel testing laboratory of the U. S. Geological Survey, let me remind you that *I had fuel tests made of the Arkansas coals in 1888, long before the U. S. Survey began the investigation of the fuel values of the coals of any part of this country.* The results of these tests are given in the preliminary report on Arkansas coals, pages 67 to 79, published at Little Rock in 1888, and it was expected that the final report would contain much additional data.

The reference to fuel testing, however, can hardly be taken as a real reason for your action, because I explicitly stated in my letter of February 9 that I should have to depend upon the U. S. Survey 'for such analyses and coking and fuel tests as may be necessary for the work.'

5. You seek to throw blame upon me for losses caused by errors in a map. The map referred to is given at page 390 of the twenty-second annual report of the U. S. Geological Survey, Part III. It is a sketch map on a scale of twelve and a half miles to the inch. If such losses ever were incurred, it is the first case I have ever heard of in which coal lands have been bought upon locations taken from a map of so small a scale.

6. The suggestion that the regular assistants of the survey must have something to do in order to earn their salaries might lead one to infer that the great bulk of the geology of the United States has been worked up and that nothing now remained but a few areas here and there like the coal fields of Arkansas. Knowing the opposite to be the truth I am unable to see that it was necessary to enter the territory of a colleague against his will for the purpose of finding work for the regular assistants of the survey.

7. In spite of the fact that my work was done eighteen years ago, and in spite of its not being up to 'present standards' you say that you were anxious to obtain it and that 'adequate payment would have been made.'

The reports of the Arkansas Geological Survey not being my personal property I leave others to characterize your proposition to pay me for one of them.

The above facts make it plain that the true explanation of your course in this matter is not frankly set forth in your three letters. The real reasons must be sought elsewhere, and I know of no place to look for them save in the general policy of the U. S. Geological Survey as reflected in its attitude toward the geologists of the country since the present director came into office.

The attitude of the survey toward the geologists of the country has come to be simply intolerable. No geologist has any rights that the survey feels bound to respect, unless indeed the geologist has political backing that makes it worth the survey's while to treat him with some sort of consideration.

If this treatment of myself and of my assistants were the first instance of the kind there might be some hope of the matter being set right; but such is not the case. Not only are our fields of operation unceremoniously invaded, but work

is taken out of one man's hands to be put into another's without any reason other than the authority given by the power to do it, or through some desire to favor one person rather than another. If one asks for a reason he is grandiloquently referred to the general authorization to 'map the national domain.'

By this process not only are the rights of individuals encroached upon, but local interests are overridden, state organizations are first discredited and then driven out of existence, and even the privacy of our educational institutions is invaded and discredited in the eyes of the very people for whom and by whom they have been founded. In Arkansas the national survey gradually invaded the field of the state survey until now it would be impossible to induce the state to carry on a geological survey of its own. If members of the legislature were now asked to provide for a state survey they would simply say that such work was entirely unnecessary because if it were wanted the national survey would do it and work already done would be cited in support of the statement. By this process have the state surveys, formerly the pride of the states, been either completely wiped out or so enfeebled that they only survive with the consent and approval of the national organization. Sometimes this approval is under the form of 'cooperation' by which the state appropriates money for the use of the national survey. In some instances the director of the U. S. Survey has even gone to the extent of writing to members of state legislatures and advising against the support of state surveys unless it were done in a way to suit the national organization.

A single case of the discrediting of local geologists by the policy of the present director of the survey is sufficient to show where every teacher of geology in this country stands if the survey sees fit to use its power to discredit him.

A few years ago the national survey sent an assistant to work up the geology of the Fayetteville folio in the state of Arkansas. Fayetteville being the seat of the State University, the professor of geology in that institution, in order to save his face, was compelled to ask as a favor that he be allowed to help, in a subordinate position, to do the work on his own campus and in his own door yard. And even though this concession was finally made, he stood discredited as a geologist before the people of the state, before the trustees of the university, before his colleagues in the faculty, and before his own students. For what were they to think of him as

a geologist if some one had to be sent in from elsewhere to do the work under his very nose?

And if the professor should protest, what answer would he get? That the assistants sent to do the work are competent men; that the national survey is authorized to enter every part of the national domain; that the state institutions have not the money to do the work with; that the assistants of the survey must do something to earn their salaries. And these things are all true enough, though the total results are none the less unfortunate and none the less fatal to an interest in geology among the people. For if the national survey can thus, under cover of national authority, injure the professional reputation of the professor of geology in one university, it can do it for any professor in any college or university in this country, and we have no redress.

Against all this sort of thing I not only enter my most vigorous protest, but I can not allow my name to stand on the roll of an organization so thoroughly undemocratic, and so thoroughly out of sympathy with the local interests of the country. In my opinion a public bureau administered in the spirit that has grown up in this one ought to have no place in a republic where it is important that there should be a widespread interest in science, and above all a feeling of safety for every worker, however humble.

Finally I beg to remind you that the question here at issue is not a question of geology, but a question of the administration of a public bureau.

I remain

Yours respectfully,

J. C. BRANNER.

THE PRESIDENCY OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

ANNOUNCEMENT has been made that the executive committee of the corporation of the Massachusetts Institute of Technology has selected Dr. Andrew Fleming West, professor in Latin in Princeton University, for the vacant presidency. It is ungracious to question an appointment of this character, and nothing could be gained by criticism if it were not that the corporation has not yet acted and Professor West has not yet accepted.

Professor West possesses many of the qualities that should be found in a college president. He was not elected to succeed President Patton at Princeton, but he would have been

an excellent president for an institution, which more than any other of our universities or semi-universities has been imbued with his ideals. These may be illustrated by a quotation from Professor West's most recent address. He writes: "And so I return to the opening thought: The old college ideal is the true one." The opening thought was "The living root of the old faculty, as of every other part of the college, was a distinctively Christian impulse * * * the old college faculty at least professed and tried to show that God is the end of all our knowing and that Christ is the Master of the Schools."

But it is a long way from the chair of Latin in a classical and monastic college to the presidency of the Massachusetts Institute of Technology. It is to be feared that the trustees who favor the election of Professor West have been influenced by two factors. He is said to be known at Princeton as 'three-million-dollar West,' in view of his part in securing endowment for the institution, and he is known in the educational world as an opponent of President Eliot and the Harvard system. The writer once heard Professor West read a paper in which he said that the connection of the elective system and the three-year course at Harvard University was perhaps not accidental, as three years were enough of that sort of thing. But it is dangerous to cross swords with President Eliot, who replied that he had also noticed the connection between the elective system and the three-year course, but that he interpreted it as meaning that under the elective system a student could accomplish as much in three years as he could in four under the fixed curriculum.

It would seem to an outsider that in the present emergency the Massachusetts Institute of Technology needs for its president one of its own men, imbued with its methods and traditions, a man bred to science, believing in science as the chief factor in culture and in life, knowing that pure and applied science must go forward hand in hand, a man who would ally the institution with the city and the state rather than try to coax money from millionaires.