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THE STATE OF WYOMING

Office of State Geologist

Cheyenne

Nov. 20, 1930.

EDUCATIONAL RESOURCES

Prior to this administration no serious attempt seems to have been made to point out the attractions that Wyoming offers for the study of several branches of natural science. During present biennium considerable effort was expended in advertising a type of resources generally considered to be of a tootemous variety to be listed as such. Efforts so far made within this neglected and rather fertile field also brought forth a number of extremely receptive replies.

Naturally, the classical laboratory that is Wyoming will always prove most inviting to students of the geological science. Nevertheless, it also presents opportunities in other fields of endeavor. In a letter addressed last summer to a professor of botany, mention was made of some other Wyoming attractions. Inasmuch as the letter also presents a quite seasonable summary on a new type of educational development in this State, it follows below in the complete form:

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Professor of Botany,
Western State Teachers College,
Kalamazoo, Michigan.

Dear Professor:

Your welcome announcement that you are bringing 25 students of your botany class to Wyoming for the object of studying our variegated floral and faunal life reached my desk this morning. Permit me to congratulate you in selecting the rich Wyoming field as the logical site to lead your class to during the present summer season.

To the faunal naturalist, Wyoming has long remained a welcome paradise. Wyoming has a varied physiography and climate as well as tremendous natural resources. Moreover, it is among the foremost of our states in its wealth of natural scenery, culminating in the grandeur of Yellowstone National Park, one of the wonders of the world. In addition to this distinction, Wyoming possesses vast open plains and lofty mountains whence flow the headwaters of mighty river systems emptying far away in both the Atlantic and Pacific oceans. The various slope exposures of our mountain ranges, the fertility of our intervening valleys or basins and the aridity of our desert spaces, present a study of geographic and vertical distribution of wild life that is in many particulars unique.

As you are aware, the study of geographic and vertical distribution of life with the governing factors and attendant problems is valuable as a matter of scientific research in general as well as in the attainment of practical erudition for the younger minds, in particular. Within the borders of Wyoming an extreme difference in altitude of 10700 feet actually appears. Within this wide vertical displacement, the life zones range from the Upper Sonoran, at the lowest and warmest elevations, thru the Transition, Canadian, Hudsonian to the Arctic-Alpine zone, the latter occupying the treeless crests of our highest mountain ranges.

Of the seven North American transcontinental life zones, only the Tropical and lower Sonoran are absent in this State. In all others a generous representation of plant and animal life is found. All told, due to the profound elevational differences and resultant precipitation and climatic changes, a student can observe within the course of one day a wider variation of wild life in the Wyoming Wonderland than he can possibly see anywhere else at least say on this side of Kalamazoo.

This progaganda bureau must apologize for the paucity of publications it has prepared about Wyoming on subjects appertaining to the highly specialized fields of science in which your activities are now chiefly confined. Unfortunately, neither this office nor any Federal Bureau has as yet published a genuine relief map of Wyoming. The best aid, that I can offer for the physiographic studies of your class, is our Wyoming contour map roughly drawn on a vertical interval of 1,000 feet. To point out the geological facts that you desire to emphasize during your forthcoming tour, I am also including a copy of the Areal Geology Map of Wyoming in the package addressed to you this day.

As now organized, fully 80 percent of my funds are expended on the protection of the vitally important oil lands on which this State conducts big operations directly under its own name. With present personnel, only a small amount of scientific or quasi-scientific literature can be broadcasted about Wyoming. So far, the only bulletin that I have published on our faunal life is "The Dinosaurs of Wyoming," a copy of which is also being mailed to you. While having nothing to do about present day activities, it at least points out certain localities in this State in which fossil life did attain its most grotesque, bizarre and colossal stage of development for all time. It is possible that you will likewise include some of the more historic tomb sites, pointed out in that guidebook, in your itinerary. A volume recently published on the mineral resources of Wyoming, that has a chapter on local climatology is also included in the shipment that goes forward to you this day.

Yearly, an increasing number of colleges are learning the wisdom of conducting their divers field courses within the scenic and vacation playground that is Wyoming. For several sciences, it affords an unsurpassable background. At present three distant universities are holding their summer courses in field geology in this State. On your arrival, you will not exactly be a total stranger. Last year, your neighbor, the University of Michigan, constructed a thoroughly modern camp in the Jackson Hole region as a permanent site to conduct their field courses in surveying directly over the most variegated types of terrain conceivable. Incidentally, that immediate locale also serves as the last stand for some of the most magnificent species of wild faunal life still habitant to the American continent. A wealth of lesser mammalian bird and fish life also happens to be convenient therat for the observation and fascination of the more impressionable minds of zoologically inclined students.

Obviously, space in this letter cannot possibly permit the cataloging of the seemingly endless varieties of herbaceous plants, flowers, grasses, shrubs and trees that bedeck the surrounding precipitous mountainous slopes of our famous Jackson Hole clear from valley bottom to upper timber line and beyond. For botanical study, especially in the higher floral zones, no more complete natural laboratory within so small a compass is to be found in this country.

No botanical class can go wrong in visiting Wyoming. If in quest of learning, a serious mistake would be made in not visiting Wyoming. The big difficulty is that no class can possibly cover the entire gamut of our floral and faunal scale of life in one season in the field. To do all of that, you will have to return to Wyoming repeatedly. So far as my records disclose, no other school has yet chosen Wyoming as the site for its field course in botany. Much good should be reaped from your original labors and resulting discoveries within the particular Wyoming field in which you selected to blaze the trail. I sincerely welcome you and do assure you that many pleasant surprises await your visit to our State.

Very respectfully,

JOHN G. MARZEL,
State Geologist.

In recurring intervals of economic stress, this bureau may be justified in preparing publicity for the attraction of depression-proof industries to this State. No one can deny that through the combined activities of outside students considerable added information about our State is brought to light. Moreover, their expenditures do not retard the development of the several communities in which they conduct their field classes. Apparently, it pays to advertise the educational resources of Wyoming. If the recent rate of expansion continues, this bureau may be compelled to transfer the new line of work to the Department of Education or to the several schools of science connected with the University. The preparation of scholastic publicity about Wyoming consumes considerable time and already some citizens look upon such efforts as a wide deviation from the prescribed duties of this office. At all times such matters cannot receive attention without neglecting important local work.

OTHER SCIENTIFIC EXPEDITIONS IN WYOMING

Through the labors of distinguished visiting savants, more sensational finds of fossil life were unearthed in this State during past summer than since the seventies when the first North American discoveries of dinosaurs were exhumed in the Wyoming wonderland.

Four miles south of Torrington an expedition from Harvard University uncovered an Oligiocene bone layer one-half mile long, varying in width from ten inches to three feet. Over 6,000 pounds of fossil material, chiefly of little ancestral types of horses and rhinoceroses, were shipped therefrom for display in the Harvard Museum of Comparative Zoology.

At the same time, the Harvard expedition uncovered large quantities of bird material. Until last summer but few bird bones had been found anywhere in the Oligiocene. Those discovered at Torrington are said to be in a state of preservation almost equal to the birds that were entangled in the La Brae tar pits of California during far more recent periods of time. The rich finds at Torrington will fascinate paleontologists and, as soon as they are better known, Wyoming will offer an added attraction for students and scientists to conduct basic research investigations.

The Smithsonian Institution also conducted a highly successful fossil hunting expedition in Wyoming during the past summer. The expedition was headed by their curator of vertebrate paleontology, C. W. Gilmore, who is one of the most widely known graduates of the University of Wyoming. From Eocene strata

of the Bridger Basin, Dr. Gilmore and a staff of far-famed assistants shipped 24 cases of fossils weighing 7,400 pounds for exhibition in the halls of the great scientific institution of the National Government.

For many years past, the Bridger Basin locality south of Lyman has been recognized as one of the most varied and prolific fossil areas in the United States. Among the material exhumed this season were examples of ancestral horses, tapirs, a rhinoceros, and also exceedingly rare specimens of turtles, lizards and crocodiles. Bones from Northarctus skeletons were also found. In a subsequent interview in a Washington daily, Dr. Gilmore stated that studies of that primitive primate should shed much light on the origin of mankind, itself.

Heretofore, Wyoming's unusually rich wealth of existing faunal life has done its share to attract sportsmen and tourists to this State. From hence on scientists will also visit the Wyoming faunal paradise. These new visitors will study the far more varied and spectacular life examples of the geologic past. To inventory and disseminate information on the increasing number of marvelous finds made, this office, like several other states far less rich in fossilized life, may soon be compelled to add a paleontologist to its staff. Not all of us can be authorities on the subject and merely to talk understandingly on the importance of recent Wyoming discoveries, no paleontological candidate should be hired who had less than eight years of highly specialized collegiate training within that limitless field of science. In the meantime, to attract more students and gatherings of scientists to this State, this office should publish more bulletins on the type of its latest number--"The Dinosaurs of Wyoming". In a geological sense, the future welfare of Wyoming should not be wholly dependent on actual mineral production. Other ways are open to attract equally worthy activities to this State.

Lesser known institutions also conducted fossil hunting excursions over the promising Wyoming terrain during past two-year period. As soon as their discoveries are published and exhibited, additional colleges will select Wyoming for their field of observation. Outside educational institutions are gradually recognizing Wyoming as the logical site for practical study and, in order that our youth may also know their Wyoming, organizations like the Rocky Mountain Oil and Gas Association and the State Mining Congress now annually pass resolutions asking that geology be taught in our own schools. Since my encumbency, six high schools

in this State; Lander, Lovell, Lusk, Rockypoint, Rock Springs, and Sheridan, added geology to their curricula.

Moreover, for the first time, the State Department of Education will conduct courses in practical prospecting. Announcements will soon be made of the classes for prospectors to be held in Casper and Laramie during coming winter season.

AN ADJOINING STATE SUBSIDIZES STUDENT SURVEYS

Already, some states have found it profitable to offer financial inducements to prominent institutions of learning to conduct geological survey work within their borders. So far, outside colleges have selected Wyoming as a site for holding their field classes without formal invitation on the part of the State. However, no state has yet offered subsidies in this direction without demanding the completion of a comprehensive mapping program. To be acceptable, the work is done by an experienced geologist and a corps of assistants consisting entirely of college graduates.

At present writing, the Department of Geology of Princeton University is carrying on negotiations with this office with the view of completing an extended mapping project within Wyoming during coming summer season. Last year most of their work was in Montana and, through their efforts, no less than six quadrangles have been surveyed to date. Some of this work was done along the Wyoming state line and, in view of important geological findings, the field forces desire to follow up their investigations on promising areas across the line in this State.

Towards the close of the season the officials of the University visited Wyoming and, after completing a reconnaissance survey, their plans for the coming season were discussed with leading residents of Cody and other points in the Basin.

At present, Princeton offers a graduate course in practical field geology in which only holders of their different scientific degrees are privileged to attend. To attract the class to Montana, the cities of Red Lodge and Billings, the Northern Pacific Railroad, and the Montana School of Mines financed half of their expenses, leaving only the remainder to be paid by the University itself.

The present work is under the supervision of Prof. W. T. Thom, Jr., who for the twenty-five years last past, was field geologist for the United States

Geological Survey. In view of his prior employment, the Federal Survey apparently continues to accept some of his work for publication. In recent years, Prof. Thom has done considerable work in Wyoming while in the employ of the U. S. Geological Survey. His report on that portion of the Gillette coal field, in which is situated America's greatest strip-mining coal seam, is an extremely important contribution to the knowledge of Wyoming geology. In fact, since his report appeared two years ago, this office has been in a position to recommend the Gillette area as the site where limitless quantities of coal could be mined at the lowest possible cost in the United States. At present writing such authoritative information attracts the attention of a growing list of industrial enterprises whose manufacturing processes are mostly dependent on the availability of huge stores of energy at the cheapest cost obtainable.

In view of the non-academic style of the professor's prior labors in this State, it is not surprising that he selected the highly mineralized Basin area as his next site for an extensive mapping program. His work has the practical slant, and, in view of his ability as well as the degree of training possessed by his assistants, I recommend that the coming legislature appropriate the sum of $2,500.00 for the purpose of surveying certain areas in the Basin district.

In my opinion, no part of the said fund should be expended until it is matched dollar for dollar by Basin communities and corporations. In the past, much criticism has been filed on the failure of this bureau to conduct elaborate investigations in that increasingly promising region. Manifestly, even if the State would have the requisite machinery and personnel, the cost of its surveys would greatly exceed the largely non-salaried Thom plan that is half financed by an outside corporation before any local funds can be expended thereon.

The recommended appropriation approaches the funds so far contributed by the Montana School of Mines for work in that state. In my opinion some sort of an institution should make a similar contribution in this State. Inasmuch as only the localities surveyed could benefit through the investigations, they in turn should offer direct aid even if said communities are smaller than those in Montana in which similar work has already been completed. Moreover, as far more than the appropriated sums are expended within the mapped localities, the plan offers some direct returns as soon as it is under way.

After many years a leading University at last has evolved a course

of graduate geologic instruction sufficiently practical to meet the sanction of the Federal Survey. In addition thereto, at least one outside state has already backed the new theory of instruction in a substantial manner. Already, the original idea of Dr. Thom is receiving much attention in educational circles. In time other universities may also deem the Wyoming field to be an extremely inviting area to carry on similar courses of intensified training. Desirous of working in a locality in which important discoveries could be brought to light, I suggest that residents of the Basin region make a careful study of the mapping plan proffered by Doctor Thom. At present, the funds at the disposal of this bureau are entirely consumed in oil protection and routine office work. With present personnel no surveys can be conducted in any part of the State. For completing acceptable surveys the Princeton plan is the cheapest so far offered to the taxpayers of Wyoming.

In the October 24th issue of the Inland Oil Index, a lengthy review appeared on Princeton's activities in Montana. After setting forth the cooperative aid extended by several Federal and State departments, local railways and Chambers of Commerce, the Index filed the following conclusion on the work in Montana:

> "During next summer it is expected that the work will extend southward into Wyoming following the natural continuity of the Yellowstone Plateau and Big Horn basin across the Montana-Wyoming line. This undoubtedly will be done if a cooperative arrangement should be participated in by Wyoming organizations as was the case in Montana. It is understood that the department of geology of Wyoming State University and the department of geology of the State of Wyoming now have this subject under consideration. It is quite probable that the next legislature of Wyoming will be asked to appropriate a small amount for this work.
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> "At the state mining congress held im Lander last summer, talks were delivered by members of the geological party operating in Montana on the advantages of such a program and the results accomplished in Montana. It is known that the subject has been broached to Governor Emerson, State Geologist Marzel, various parties in Cody, and to Casper Chamber of Commerce. It is also understood that all familiar with the plan have been in sympathy with its adoption.
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> "During the last summer a considerable area was mapped of the Yellowstone plateau and there was some work done in the Greybull valley, near Cody, Wyo. Aerial photographs were taken by U. S. War Department and the U. S. Geological Survey, These maps will soon be ready for distribution.
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> "Last year the sum upwards of $5000 was contributed by Princeton University, the Northern Pacific Railroad and various Montana interests. This sum was matched on practically a 50-50 basis by the U. S. Geological Survey. It will thus be seen that any sum raised for this purpose for operation in Wyoming would be doubled by monies received from the Federal Government.

"Some of the fossils discovered last summer in beds near Red Lodge are now being classified at Princeton and indicate some very important scientific discoveries. For the first time in the history of the world, dinosaur eggs have been discovered on this continent. This would indicate that that part of Montana was dry land anywhere from 10 to 20,000,000 years ago. The only other place in the world where dinosaur eggs have been discovered was in Mongolia.

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"Among other interesting finds was the jaw bone of the coryphodon. This bone was about twelve inches long and contained a number of saw teeth. Also a tusk supposed to belong to the same animal was found. The coryphodon was an animal which very much resembled the rhinoceros. It is supposed to have lived at one time in a swampy, sub-trophical country.

"Early in the summer a large number of small jaws were found which will be added to the museum at Princeton and also used for research work. Some belonged to primitive primate-like animals about the size of a very small monkey. Others are what may prove to be the earliest ancestors of the Artiodactyla. This group includes the present-day cattle, hogs, sheep, antelope, camels, and many other well-known animals.

"Dr. W. T. Thom, Jr., who had charge of the expedition representing the department of geology at Princeton, is well known in the Rocky Mountain region, having been a geologist in the U. S. Geological Survey with headquarters in Wyoming. He was a frequent visitor in Casper and, several years ago, made a special investigation of Teapot Dome for the Government."

Other important fossil discoveries were recorded in the Index review. In fact, the mentioned dinosaur discovery has already been reported in all of the larger papers in this country. In no sense of the word has such wide advertising harmed Montana. In my opinion, it detracted much from the fame of Wyoming, the state that first produced dinosaur discoveries in this continent.

The preceding extracts were made for the reason that they quite well define the cooperative endeavors and equipment of a complete and modern mapping unit. Obviously, this department is in no shape to attempt such work by itself.

In recent years, residents of the Basin have been reporting an increasing number of rather bizarre fossil discoveries on their land holdings. For the advancement of science, the day has arrived for a thorough examination and final classification of these different discoveries on the part of a trained crew of field specialists. Manifestly, if the educational attractions of Wyoming are to be correctly cataloged, considerable guesswork should be brought to an end forthwith.

Across the line in Montana, the Princeton staff made discoveries last summer that startled the scientific world. If their labors are extended into the adjoining Wyoming area, equally amazing discoveries should be made.

During past year, both Harvard and the Smithsonian Institution succeeded in placing the Torrington and Lyman areas on the scientific map of the world. At the present time, Princeton University anticipates that a third Wyoming locality may soon achieve similar fame. Obviously, the earlier such localities are authentically reported and mapped, the earlier Wyoming will be recognized as the great national laboratory for the study of geology by the growingly popular field-contact method of procedure.

COOPERATIVE WORK WITH THE FEDERAL SURVEY

In recent years the activities of the U. S. Geological Survey have been rapidly approaching the vanishing point in this State. As time goes on, the Federal Survey is gradually confining its entire mapping programs to those states that are willing to finance half the expenditures of their investigational work.

In order that a better understanding could be had on the present policy of the Federal Survey, an invitation was extended to one of its members, Dr. G. F. Loughlin, to address the State Mining Congress which was held in Lander in August, 1930. His address follows below in the complete form:

> "I received a telegram in New Mexico the other day asking me to come up here and talk about cooperation. My talk will be informal. Cooperation between the United States Geological Survey and the states has been going on to some extent for a great many years. Topographical work was the first work to be done that way. In the water resources, much cooperation has gone on. In geologic work considerable cooperative work has been done for the states. The most efficient way is to call on the United States Geological Survey to send one of its specialists. In the mining industry, coal and oil have been under the cooperation of the United States Geological Survey and the states for some time. The growth of metal mining and geology began in 1922. It has since increased until the last biennium report of the State of Colorado shows that Colorado appropriated $45,000. Last year we had twenty employees in mining and practically all of them were engaged in cooperative work.
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> "Cooperative money offered by the states also increased so that now we have 32 employees and all but one of them in cooperative work. There are many mining problems in the program which we like to follow up but it is impossible because of the demand for cooperative work. At present we have seven geologic parties in Colorado. There are six parties in Oregon. Other cooperative work is going on in New Mexico, Nevada and Montana and in a way you might say California.

"The results of the work are based on what we find and as these states have found out, it is better in the long run to call a large organization which has the equipment to carry out these complicated programs. Any geologist can make a topographic base map but the United States Geological Survey has specialists in this line. With the geologic work itself, it is necessary to have one or more excellent geologists but one or two cannot usually cover all the work that has to be done.

"Next comes the preparation of the report. After the report is done, the problem of illustrating comes. If it is a simple report, it would be an easy matter to print and the state organization could contract with the local printing works and get it done. If it is to be an elaborate report, the cost runs up and the facilities for doing the work are limited. The United States Geological Survey has the best printing facilities for such work. The Federal Survey has to bid competitively against outside organizations. If a state is to publish one of these professional papers, it would be necessary to spend a few thousand dollars. Expert draftsmen and qualified editors are at your service in the United States Geological Survey. The value of the report will last as long as people are interested in mining geology. The advantage of cooperation is obvious.

"Colorado first appropriated $500.00 for cooperative work. The amount during the recent year would be somewhere in the neighborhood of $60,000.00 which was appropriated to the geologic mapping and study of mining districts. With that general statement, perhaps questions could carry the information further than I could alone.

"In regard to the suggestion put forth by the gentleman from Princeton, regarding the cooperative work done by Princeton University, I would say that as far as the allotment of funds is concerned, I do not think that we would have anything to do with that. Dr. Thom was formerly in charge of our fuel section. Any work done under him would be of as high a grade as can be expected from graduate students. When it comes to the expenditure of funds, the survey is restricted to public institutions and educational institutions. As far as this business enterprise is concerned, the Survey would be glad to assist the work in any way it can.

"As to a possible program for this state for the next five or ten years, I would say to begin modestly. If you agree to have some work done next year, no doubt we would have two or three experienced geologists who could start then. To begin in a hurry would be out of the question. We do not let anyone attempt independent work unless he is qualified. An appropriation of $5,000.00 would finance one small party and you could increase that appropriation annually and let the work grow as fast as possible. The United States Geological Survey would be glad to start anywhere the state wants the work started."

The foregoing address plainly indicates that the present mining investigations of the Federal Survey are almost exclusively confined to those states that finance half the cost of the work. Lately much has been heard about big mineral developments in neighboring states while nothing new is going on in Wyoming. A study of the preceding address shows that several of our neighbors have already engaged the Federal Survey to conduct extensive surveys of their more promising mineralized area.

Dr. Loughlin mentioned the complete equipment and personnel the Survey has on hand to carry out the growingly complicated programs that are typical of geologic investigations of the present period. In his later conversations, he mentioned that before one of their cooperative reports reach the printers, it receives the attention of more than thirty of the highly trained specialists on the staff of the Survey. Manifestly, to expect the Wyoming Geological Survey to turn out work of a similar parity, exactitude and finality, is to ask the impossible.

Regardless of the fact that the Federal Survey extends no invitation to states to enter into the growingly popular cooperative phases of their work, the following resolutions were unanimously passed at the recent mining congress held at Lander:

> "Whereas, the proper exploitation of the unlimited mineral resources of Wyoming require that definite information be made available for dissemination to industrial and mining concerns regarding the location, extent and quality of the varied deposits of metallics and non-metallics in the State, and
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> "Whereas, the United States Geological Survey is equipped and prepared to make topographical maps and aerological maps and serological reports on the extent and quality of mineral deposits within given areas, and
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> "Whereas, the United States Geological Survey is authorized by act of Congress to make surveys and investigations in respective states, on a cooperative financial basis, and,
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> "Whereas, there are extensive areas in Wyoming that require mapping and geologizing in order that they may be economically exploited and developed,
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> "We, therefore, recommend that the next session of the Wyoming Legislature be requested to appropriate money to match funds of the United States Geological Survey with which to carry on mineral investigations of the most promising areas in Wyoming.
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> "We, therefore, recommend that the Committee of Eleven be requested to sponsor and handle a bill in the next session of the Legislature designed to secure a reasonable appropriation from the state, with which to match funds of the United States Geological Survey for the purpose of carrying on mineral investigation of the most promising areas in Wyoming."

The foregoing resolutions are also endorsed by this department. In my budget estimate, I asked that the sum of $5,000.00 be appropriated in the manner specified by the preceding resolutions. Instead of being one of the last, the banner mineral royalty paying State of Wyoming could have well afforded to lead the way in cooperative activities. In the last 10-year period, public treasuries have been enriched more than $60,000,000.00 from royalties accruing from mineral operations in Wyoming.

In the way of a comparison, I mention that the requested appropriation is one-twelfth the sum expended in 1930 alone on Federal cooperative work in an adjoining state in which mineral royalty receipts have been negligible to date. In recent years, Federal and other factors have been at work for the visible object of retarding mineral development in Wyoming. To offset banal influences now in effect, it might pay Wyoming to actually plow back upwards of one per cent of its future mineral royalty receipts on original geologic investigations of the highest type available.

Since 1926, mineral production has decreased 30% in Wyoming. This decrease has profoundly affected the economic structure of the State. Unfortunately, since Wyoming mineral production is still largely conducted on public lands, lessened activities in our most profitable industry must continue to produce the greatest shock directly on the Treasury Department of the State, itself. Seriously speaking, the day has arrived to bring more facts to light on the mineral potentialities of Wyoming. Possible avenues to regain former mineral royalty levels warrant thorough study at this critical time.

Plenty of promising area remains for investigation in Wyoming. As yet, not half of the 20,000,000 acres, long recognized as mineral in character, has been mapped and geologized in contour form in this State. At present, the cooperative program of the Federal Survey offers the most economical method for financing final mapping campaigns of extended mineralized areas exceeded by no state in the Union.

FIELD GEOLOGIST

In the past two-year period this office has received as many as ten requests from a single individual to make an investigation of his private mineral holdings. On other occasions, local Chambers of Commerce have asked for complete reports on highly mineralized areas known to exist in their respective neighborhoods. Invariably all of these solicitations had to be refused.

Probably, due to the welfare aid extended by an increasing number of county agents and lady home demonstrators employed in this state, more folks seem to be of the opinion that this non-agricultural department likewise maintains a similar force of specialists for the solution of highly varied mineral development problems. As yet, no like staff of experts is employed by the mineral industry in this State.

To meet these frequent requests, this office would be glad to have the services of a field geologist at its command. In view of present demands for such a man, no more than his salary should be paid by the State, itself. Should a citizen or corporation desire an investigation of their private holdings, the expenses of the field geologist should be paid by them. Manifestly, the same remarks would also apply to Chambers of Commerce desirous of having extended surveys and reports made on the mineral possibilities of their particular localities.

As the expenses and partial salaries of Agricultural Agents are paid by local communities somewhat similar arrangements should be made for the time of a field geologist. At present most requests for examinations come from the northern and central sections of the State. Due to the previous employment of present personnel, this office is generally in a position to report on the potentialities of the larger mineral deposits of southern Wyoming without further investigations in the field. Wyoming is a large state and a geologist who performed ten or more years of work in the northern counties should visibly widen the efficiency scope of this department.

By no means would the employment of an additional man remove all of the criticism frequently directed against this bureau. Some states that approach Wyoming in mineral production already carry at least a half dozen types of academic and technical specialists in their geological departments. Apparently, in other states survey work is maintained wholly for the idea of advancing their several communities in lieu of collecting royalties from their own mineral operations. In the latter respect, Wyoming is in a class by itself.

To expect the Wyoming department to turn out the parity of work performed by state surveys employing paleontologists, chemists, mineral technologists, librarians and generally several topographers and draftsmen on their respective staffs, is really asking too much. In addition to primary oil protection duties, the time of this office is more and more pressed in collating, interpreting and summarizing, wholly from the Wyoming angle, the significance of geological research work annually conducted by an expanding list of distinguished visitors in this State. Until such gratuitous endeavors lessen within the increasingly attractive Wyoming research field, further complaints on the incomplete and dilatory services extended by this bureau must reasonably be anticipated.

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