

occurring in several veins in Geneva Gulch, but a few miles distant from the above mine. He also referred to the bismuthenite found near Golden, Colo., and commented upon the frequent occurrence of molybdenite with bismuthenite in quartz veins, as at Golden.

Mr. Ridgley said that he knew of an occurrence of bismuthenite and molybdenite in a pink quartz vein at the head of Big Thompson Creek, Larimer county, Colo.

Mr. Frost referred to a bismuth mineral, supposed to be bismuthenite, from the "I. X. L." mine, near Breckenridge, Summit county, Colo.

Mr. Hills said there was reason to suspect the presence of native biswuth with the schirmerite of Howard's Fork of the San Miguel River, and Mr. Ridgley mentioned having arrived at the same conclusion in regard to some crushed material he had examined from that district. Mr. Hillebrand referred to the presence of bismuth minerals in small quantities in the Florence mine, near Leadville, Colo.

MEETING OF JAN. 7TH, 1884.

Address of the retiring President, S. F. EMMONS.

Gentlemen of the Colorado Scientific Society :

In retiring from the office to which you were kind enough to appoint me a year since, I have to express my regrets that I have been able to contribute so little to the objects for which we organized, and to thank you for the indulgence you have shown to my derelictions. My regrets at not having been able to be present at your deliberations have, however, been tempered by the conviction that my duties have been better and more efficiently performed by our worthy Vice-President than they would have been had I been there.

It is a time-honored custom in societies like ours that the retiring presiding officer should, in resigning his office to his successor, present some sort of a review of the progress during the past year, either of some branch of science, or of the work accomplished by the particular organization over which he presides. In accordance with this custom I submit the following remarks, asking your indulgence for their imperfections, which are necessarily the greater from my frequent absence.

I had the honor upon our organization, a year since, to point out to you somewhat in detail the objects for which we were met together, the splendid field of work which the immense mineral resources of the state and the energy displayed by its inhabitants in developing them, afforded to us, and to show the necessity which existed in so recently and rapidly developed a community of guarding against false or mischievously exaggerated estimates of the character and value of its resources—either by scientific charlatans, men who wish to gain a popular reputation without having the necessary foundation of accurate knowledge and technical training, or on the other hand by unscrupulous speculators, ready to resort to a falsification of facts to accomplish their pecuniary gain—by the establishment of a sort of tribunal of men, earnest seekers after the truth, and thoroughly grounded in their various specialties, whose judgment upon matters of both public and scientific interest might be received as sound and disinterested, and who acting as a body, free from the fear which a single individual might have of injuring himself in his private affairs by drawing down the ill-will of those to whose interests his opinions might run counter, would be able to speak out boldly and fearlessly in the support of the truth. I urged upon our members both collectively and individually a hearty co-operation in the promotion of scientific intercourse, by the contribution of papers upon subjects of interest which they may have had occasion to investigate, and by the bringing up for discussion at our meetings of any points which, while not sufficiently studied for treatment in specially prepared papers, yet might be further elucidated by suggestions and observations made by fellow-members. I pointed out to you the importance in all such papers and discussions of conciseness and accuracy of statement, and of the careful avoidance of too great diffuseness in matters of only limited or individual interest.

During the short year of its existence our little society has certainly made most creditable progress. From a membership of only 12 at our first meeting, of which this is the anniversary, we have increased to 31, and we recognize among these newly enrolled names those of men well calculated to advance the objects of the society, and many who have already practically proved their ability. We have listened to interesting and instructive papers upon new

methods in the chemical investigation of metals—on the geology and manner of occurrence of ores in Colorado mining districts—and the discovery of minerals not only new in this part of the world, but some new to science—upon glacial phenomena in Colorado—upon the geology and volcanic phenomena of the far-distant Dutch possessions in the East Indies—and suggestions with regard to the home-question of the supply of water from artesian wells to be expected in Denver. Some of these papers, either in full or in abstract, have been published in scientific journals and periodicals, inasmuch as our society is yet unable, financially, to have a journal of its own. Their ready acceptance by the editors of such publications is sufficient proof of their value in the eyes of the public. The time will doubtless come when we shall feel called upon to publish our papers and an abstract of the proceedings in a regular journal of our own, commencing at first with a single volume per annum. It may be well to have you consider even now how soon, and under what conditions, such publications may become advisable. For my own part, it would seem wise to act with considerable deliberation in the matter, and to make ourselves quite sure, before taking the important step of commencing the publication, that the number and productive ability of our members is sufficient to keep it up, even admitting, which is of course the first point to be considered, that our finances are in a sufficiently flourishing condition to warrant it.

We have acquired during the year by the generosity of some of our members a valuable, though as yet numerically small, collection of minerals; one, however, which if it increases at the present rate, will soon be the most complete and extensive in the State. Such collections are much more appropriately made by an organization like ours, than by an individual. Not only does each member have free access to the combined collections of his fellow-members, but gifts of minerals from miners and mining companies can be more freely asked for, and will be more readily given to a public society than to an individual; moreover, that the name of the donor appears in a prominent place in such collection is with most people a most powerful inducement for making the gift. It would seem a worthy object of the society to make this collection in time the type of the mineral resources of the State, and comprise specimens of all its

known minerals, whose variety and number are so remarkable. We might further even include characteristic specimens of ores, and metallurgical products. A most valuable commencement in this way might have been made this autumn, had we already possessed a large room of our own; for, the case of collections of the Chrysolite mine, which had been exposed at the Exposition, was offered to any one who could give them a fitting place. It has already been suggested that the Society should have a room of its own in which meetings could be held, and where its collections could be permanently placed. While I would not wish you to feel that the present condition of things causes any inconvenience to members of the Geological Survey, or that the room given to the Society is at all begrudged, I can readily see the advantages which would accrue to the Society from having a room of its own. Its members would feel more at liberty to consult the collections at any time, and would perhaps be led to meet each other informally between the regular stated meetings. The important question is, of course, as to whether our finances are in such a condition as to warrant the expense, and for this I must refer you to the Treasurer's report.

I would here make a suggestion of my own for your consideration and discussion, confessing, however, in the beginning that its accomplishment might very likely not be practicable, or even be considered advisable by you. It is that some sort of a charter be obtained from the State Legislature, which may give us an official position, bearing possibly a similar relation to the State authorities as that which the National Academy of Science bears to the general Government, viz: that the Legislature should be authorized to refer scientific questions, of importance to the public welfare, to the Society for its opinion or investigation. In such a question the President would appoint a committee of members best fitted in his judgment to investigate this particular subject, and their report, before going to the Legislature, would be first submitted to the criticism and discussion of the Society, and constitute part of its proceedings. In return for the public services thus rendered to the State, we might ask that a room or rooms be assigned to our exclusive use in one of its public buildings; and thus the problem of providing rooms sufficiently large to accommodate our collections without completely depleting our treasury would be solved.

As an earnest of what might be done in making investigations of subjects of public welfare, I would suggest that the Society, as such, might with propriety take up the question of artesian wells in Denver. Suppose that the President might appoint a committee of geologists, chemists and engineers. The geologist could examine the rocks passed through, their character, thickness and structural relations; the chemist may analyze the waters, and, if deemed necessary, the rocks; the engineer calculate the present actual supply derived from the wells; and then comparing results, or by combined investigations practical results as to the question of what may be expected in the future, and the precautions to be taken against wastage, may be obtained. Such investigations would naturally be comprised in the Report on the Denver basin, which is in preparation by the Geological Survey. But the two interests need not clash, inasmuch as the subject demands a more immediate attention than, owing to the press of other work, the Survey can give to it, and the Survey would be very glad to have so much of its work done for it in a way that would insure confidence in the results.

On the Estimation of the Capital requisite for Investment in Mining Properties, BY P. H. VAN DIEST.

It happens frequently that a really good mine does not answer the expectations entertained. The reason for this can be often ascribed to the fact that too large a sum was paid for the property, or that not a sufficient amount was appropriated for opening it.

I believe that in many cases reports on mining properties give principally general observations indulging too much in suppositions tending to a favorable opinion, or, if figures are used, they are often so dextrously grouped that, if they do not mislead, it yet remains difficult to use them for an appreciation of the value of the property.

Seldom is in a report the value of a property deduced from calculations based on facts ascertained with great care, wholly excluding all that is not known with certainty. In most cases, however, it is possible to estimate the value of