

The next meeting of the Society will be the Annual Meeting for the election of officers, Friday, December 28, 1900.

F. N. COLE,
Secretary.

DISCUSSION AND CORRESPONDENCE.

ON THE SUPERINTENDENCY AND ORGANIZATION OF THE COAST SURVEY.

IN view of the fact that the superintendency of the U. S. Coast and Geodetic Survey is about to pass from the present incumbent to some successor, the following statements may be of interest:

First, as regards the selection of a superintendent. Here there ought to be no serious difficulty; for, although persons suitable and available for the position are not numerous, the appointing power is free to select from all who may become known to him. He is not, like the voter, practically confined in his choice to two or three nominees. It seems proper that scientific bodies (notably the National Academy of Sciences), if not called upon as advisers, should take the initiative and bestir themselves, in order that a suitable man for this important position may be selected. Let them at least formulate the requirements for the place; then he who best measures up to such requirements should be the one to be selected. Or, perhaps better still, an advisory committee of mathematicians, physicists and astronomers might be appointed by the Chief Executive from this Academy and the faculties of our leading universities. What is wanted is a man of mature intellect and broad and thorough scholarship. If possible, he should already have made for himself a substantial reputation in the scientific world—this would, in fact, be a proof of his thoroughness and perseverance. But let no man be selected whose sole claim is a little technical skill or a familiarity with the organization. This remark is in no wise intended to decry the importance of experience, whether in field, laboratory or observatory.

It is perhaps not very generally understood that the organization of the Survey is radically wrong or at least not such as should underlie a scientific bureau in our day and generation. Its one fatal defect is its semi-military charac-

ter. I say *semi*-military because it is open to that favoritism so much complained of in our late Spanish War, without having the wholesome restrictions thrown about a purely military organization. This places a fortunate few in virtual control of the many. In some instances this might be excused on the ground of the necessities of the case; in other words, in certain matters there must be some head. But if the fortunate few are assumed to have, by virtue of their positions, a monopoly of all brain tissue, and so are made to constitute the sole advisers of the superintendent in all matters relating to the work of the Survey, and even in the elevation and degradation of the personnel, it becomes evident to any disinterested observer that no universal good-fellowship can exist—and without this, good scientific work is impossible.

Suppose this oligarchy were to fortify itself behind certain rules designed for bureaus whose work is chiefly clerical; then an employee not specially empowered to look after others must needs be very guarded in his associations with his co-workers. Thus it might readily come to pass that persons working for years in the office at allied work scarcely have a speaking acquaintance with one another. Free discussion of work between non-commissioned employees would probably be frowned upon as seditious or as nursing conspiracies. The dangers of such a system to scientific work and thought are so obvious to anyone that its defense can hardly be seriously entertained. But there are other dangers as well as a great injustice in the system; for the management might fall into the hands of unscrupulous parties. In matters purely scientific, if there is to be any subordination, the smaller intellects should do homage to the greater; and in matters in general, unless there are most cogent reasons to the contrary, the older and more experienced should have the directing of the younger. This is a law of natural instinct and is in accordance with the laws of logic and of ethics; it is not to be lightly set aside. But enforced or artificial superiority and inferiority might put inferior minds over the superior, and make tyros chiefs of divisions and of field parties.

In this brief space no elaborate scheme of reorganization will be attempted. But it is safe

to say here that the following considerations are of fundamental importance:

1. Abolish all distinction between field and office force.

2. Leave all examinations or other tests of qualifications for appointment into the Survey wholly with the Civil Service Commission. If the Commission cannot propound suitable questions, let it consult the faculties of our leading universities. But let them never appeal to the bureau interested, save as to the general scope of the examination or other tests. If the bureau can dictate to the Commission, there is grave danger that it will override the latter and frame requirements suited to some person in whom it is interested. Again, ridiculously specific or technical questions do not well test a man's capacity nor his ability for doing work.

3. So far as possible, let the individuals do that kind of work for which they are best fitted because of their education, ability and natural liking.

4. Then base promotions in salary upon the quality and quantity of work done, unless it works obvious injustice to known abilities not well brought out by the assigned work.

5. The same rule should generally be applied in the selection of chiefs of divisions and of field parties. In doubtful cases favor the older candidates.

6. Let no set of employees have the ear of the superintendent while the other employees are seldom or never consulted.

7. Grant the greatest possible freedom in the pursuit of the work. Favor, and do not discourage, free consultation between all members of the Survey.

The preceding remarks show that much depends upon the selection of a superintendent. They show how important it is that he should be a scholarly man capable of properly judging the merits of the persons employed, also that he should encourage scientific activity as generally as possible throughout the bureau.

OBSERVER.

NOTES ON INORGANIC CHEMISTRY.

AN interesting paper by J. C. A. Simon Thomas, on the liquid carbon dioxid of commerce, has recently appeared in the *Zeitschrift*

für angewandte Chemie. The author was incited to his investigation by the widely varying prices for the liquefied gas as supplied in steel cylinders for use in the ice machines on Dutch men-of-war. The gases examined were obtained from combustion of coke (Ozouf's method), from magnesite, from carbonaceous rock, 'prepared artificially' (no further data obtainable), and from the natural carbonic acid gas from certain volcanic regions. Gas from brewery fermentation was not obtained. The gases were all found to be of fairly good quality. No sulfurous acid gas nor hydrogen sulfid was found in any case. The natural gas contained considerable water, but this was probably introduced accidentally into the cylinder. The other gases left little, if any, residue. The natural gas was almost perfectly pure, containing only a trace (0.8 per cent.) of air. The Ozouf gas and that from carbonaceous rock contained respectively 2 per cent. and 5.7 per cent. of air. That from magnesite and that artificially prepared contained 4 per cent. and 3.4 per cent. of carbon monoxid. This was doubtless due to the presence of the reducing materials used in the decomposition. This impurity should not be present when the gas is used in ice machines in confined spaces, as on men-of-war, as the machines are liable to leak when first set to work. These quantities of impurities are found in the first portions of the gas drawn from the cylinders, and after half the gas has been drawn off, the amount of gas unabsorbed by caustic potash is inappreciable. The result of this investigation is to show that the quality of liquid carbon dioxid furnished by the European manufacturers leaves little to be desired.

SINCE the investigation of the metallic carbids by Moissan, the electric furnace has been applied to the preparation of many compounds of a similar nature, and some of these, like calcium carbid and carborundum, have already found important industrial applications. A paper was read before the Chemical Section at the Bradford meeting of the British Association by C. S. Bradley, on a series of silicids discovered by Charles B. Jacobs of New York, which may prove to be of commercial value. They are silicids of calcium, strontium and barium, with the formulæ CaSi_2 , SrSi_2 and BaSi_2 , thus