This may be considered the germ, which, by its growth, may quicken with its spirit all the other elements. Second, the Minnesota Historical Society, whose plan of organization, however far it has lapsed from it, is so broad that it embraces the objects which we seek, and which would be a powerful factor in any re organization for scientific work in St. Paul. Its library, its collections, and its good will would go far toward causing the State legislatures to vote enlarged funds for its sustenance, should the ideal museum be made to include this society. Third, the Public Library of St. Paul should be mentioned as one of the elements at hand which should be brought within the pale of this ideal museum. There may be other libraries and organizations of which I am not cognizant, whose usefulness and whose expressed aims would be better subserved by a combination with others.

Add to these elements an enlightened and wealthy community, largely in sympathy with the advanced science of the day, and, I think, we have mentioned every thing on which we can depend. There are, however, other nearly allied institutions which might be willing to co-operate, and, on the plan of "university extension," join in whole or in part in a general movement. I refer to Macalester College and Hamline University. Should all these elements express a willingness to join in the creation of a great central scientific institution, for which I would retain the name of "Museum," they should all be housed in one building or series of buildings, and should be brought under one administration. Their efforts would then be brought into sympathetic and harmonious activity, and instead of smothered jealousy, one of the other, each one would have its function so defined that they would help rather than hinder each other, and the result would be a conservation of energy and money, which now are sometimes lost by being duplicated from different sources, or by being ill-advised and ill-directed.

I have sketched out what appears to me to be the museum of the future in Minnesota. I have indicated what should be its plan and its purpose. I have shown the necessity existing for such a scientific centre in this State, and I have lastly enumerated the elements that might be united in such an institution in St. Paul. The immediate steps that should be taken to bring about such an end, it will be necessary for you to decide upon should it be attempted. For nineteen years I have had the hope that such a museum might arise in Minnesota, and that in my day I might be in a measure instrumental in bringing it about. I would like to inspire some of the wealthy friends of science who reside in St. Paul with the faith which started some of the great museums of the world, or with the consecration which actuated Agassiz, or Smithson, or Rensselaer, or Franklin, in founding the institutions which bear their names.

NOTES AND NEWS.

THE effect of adding aluminum to steel ingots was discussed at considerable length at the recent meeting of the American Institute of Mining Engineers, communications on the subject by Professor J. W. Langley of Pittsburgh and Professor J. O. Arnold of Sheffield being among the papers read. Professor Langley drew attention to the very small quantity of aluminum required to render steel castings perfectly sound. The aluminum, says *Engineering*, is added in small pieces of from a quarter to a half pound in weight, thrown into the ladle during the tapping after a small quantity of steel is already in it. The aluminum melts almost instantaneously, and diffuses with great rapidity throughout the contents of the ladle. For open-hearth steel, containing less than .05 per cent of carbon, five to ten ounces of aluminum are sufficient for each ton of steel, while for Bessemer steel the amount should be increased to from seven to sixteen ounces per ton. For steel containing more than .5 per cent of carbon the aluminum should be used cautiously in amounts of from four to eight ounces per ton. Professor Arnold described briefly the results of a number of experiments at the Sheffield Technical School, from which he concludes that the action of aluminum is about twenty times as powerful as that of silicon, and the resulting steel is tougher and sounder than when silicon is used, provided that certain precautions against piping are taken. He considers that the action of the aluminum is almost certainly chemical. The blowholes in ingots are due to occluded gases, and it has been proved by experiment that aluminum readily reduces carbonic oxide at a temperature below that of melting steel. In one experiment Professor Arnold blew forty gallons of pure carbonic oxide through a crucible of molten steel containing aluminum, with the result that the carbon in the steel was increased by thirty-five per cent, owing to the reduction of the gas. He concludes that by using aluminum, manganese can be dispensed with, and a considerable saving of time and fuel effected.

— A new antiseptic, said to have certain advantages over those hitherto in use, has been brought before the French Academy of Medicine by Professor Berlioz of Grenoble. Extreme solubility, harmlessness, efficacy, and rapidity of action are claimed for it. It is called "microcidine," and, as described by *Nature*, is a compound of naphthol and soda, is neither poisonous nor irritant, is twenty times as active as boric acid, and much more soluble than thymol, carbolic acid, etc. Microcidine has the form of a grayish white powder. In a solution of three grams per litre it is very slightly colored, but it does not stain either the hands or bandages. For family use it is said to be of great service.

— An apparatus has been recently constructed by M. Ducretet, says *Nature*, for getting quickly in the laboratory a fall of temperature 70° to 80° C. below zero, by means of the expansion of liquid carbonic acid. The inner of two concentric vessels contains, in alcohol, a serpentine metal tube communicating, through a tube with two stopcocks, with the carbonic acid reservoir outside, and opening below into the annular space round the inner vessel, in which are some pieces of sponge impregnated with alcohol. This two-walled vessel with coil is inclosed in a box. One stopcock being opened wide, the other slightly, the carbonic acid passes through the coil as snow, and turns to gas, with strong cooling effect, and any of it not vaporized in the coil is dissolved in the alcohol of the sponge. The gas escapes through a tube passing through the outer box. The instrument, called a *cryogen*, is pictured in *Cosmos* of June 27.

— Experiments have lately been made by Herr Regel (*Bot. Centralb.*) with reference to the influence of external factors on the smell of plants. In the front rank, as stated in *Nature*, appears the direct and indirect influence of light on the formation of etheric oils and their evaporation. In the case of strongly fragrant flowers (as *Reseda*), heat and light intensify the fragrance, which in darkness is lessened without quite disappearing. When the whole plant was darkened, those buds only which were before pretty well developed yielded fragrant flowers; the others were scentless. If, however, only the flowers were darkened, all were fragrant. Other plants open their flowers and smell only by night (as *Nicotiana longiflora* and *Nycterinia copensis*). When these plants were kept continuously in the dark, they, in course of time, lost their scent, as they lost their starch. On being brought into light again, both starch and fragrance returned. Besides light, respiration has a decided influence on the fragrance. Nycterinia, inclosed in a bell jar with oxygen, behaved normally, but with hydrogen the flowers did not open, and had no fragrance. In general, the opening of flowers coincides with their fragrance, but there is no necessary connection between these phenomena.

— Dr. Anderson, in a recent paper on steel read before the Iron Institute, London, explains the peculiar action of the solid iron when thrown into molten metal. When thrown into a pot of molten iron or steel the solid metal at first sinks, which shows that its volume per unit of weight is less than the heated metal. But soon the solid piece becomes heated, which causes it to expand, its volume is increased, and it rises and floats on the surface of the molten mass. The action is the same with both iron and steel. The experiment was frequently made by throwing a piece of iron into melted steel. It could be seen to go down, and one might think it was on account of the impetus which the iron had attained in falling that height, but as a matter of fact if the iron were put upon a fork and lowered, it would go down. In the course of a few seconds it came up again, and kept on expanding until the piece of iron was a considerable distance above the surface of the metal. Then it decreased in volume, and of course

became of the same volume as the molten metal which it joined. Any one could see by the distance that the piece of iron went above the surface that it was of considerably less density than the molten metal.

— The German East Africa Company, according to press reports, has decided to spend $15,000,000 in building a railroad from Tanga to Karagwe. Tanga is a little seaport about fifty miles north-west of Zanzibar, and Karagwe is distant from the starting point about 625 miles. It is the country of the good old King Rumanika, who so charmed both Speke and Stanley that they credited him with most of the virtues, and pictured his country as an African paradise. The proposed railroad, by starting from Tanga, will avoid the hard climb up the Usagara Mountains. It will doubtless run almost due west to Tabora, the centre of things in inner East Africa, and will then strike north and north-west to Victoria Nyanza and Karagwe, which is within a hundred miles of the western boundary of Germany's possessions.

— The manuscript of the annual report of the Ohio experiment station was placed in the hands of the State printers in January, but the press of other work has crowded it back, so that it is only now being printed. The report contains a summary of the year's experiments, the full reports of which have been published in bulletins issued during the year. Among the subjects under investigation have been: potatoes, including trials of varieties, use of fertilizers, size of seed; commercial fertilizers, including trials on corn, wheat, and oats at the station and on farms in various sections of the State; experiments with corn, oats, and wheat, including tests of varieties, quality of seed, date of planting, and methods of culture; experiments in the control of insects affecting fruits, vegetables, and field crops; experiments in the control of fungus diseases of plants, as smuts, rusts, mildews, fruit rots, etc.; experiments with many varieties of fruits and vegetables, and investigations in some of the diseases of animals. The publications of the station for the year are, its regular bulletin, of about 260 pages; the annual report, some 60 pages; and a technical bulletin, of 100 pages, intended primarily for the use of other scientific workers. All are illustrated, and all are distributed free of cost to all persons in Ohio who are interested in agriculture or horticulture. Applications should be addressed to Experiment Station, Columbus, O.

— In the journal of the Elisha Mitchell Society, Mr. Atkinson calls attention to two new cases of protective mimicry in spiders. A *Cyrtarachne* takes shelter in summer and autumn under leaves, where it has absolutely the aspect of a small univalve mollusc, which is extremely abundant, and which often fixes itself in an analogous position. The second example is found in a small spider, *Thomisus aleatorius*, which is remarkable for the length of its fore-legs, the hind ones being, on the contrary, very short. This spider, which lives upon grasses, ascends the culm, stops suddenly, and disappears from sight. It suffices to fasten itself to a spike by its hind-legs, and to bring together its fore-legs, extended, and form an angle with the culm in such a way as to make itself nearly undistinguishable from the spikelets.

— Ultramarine has long been a chemical puzzle, alike in its constitution, the cause of its color, and the vicissitudes of its manufacture, but now, says *Industries*, there is reason to suppose that one of these questions is in a fair way to be definitely solved. Some time ago it was suggested that the color of ultramarine was due to the presence of an allotropic modification of the element sulphur, a substance capable of many vagaries. Mr. F. Krapp has recently pursued the former line of inquiry by investigating the so-called "black sulphur" of Magnus, which he finds to be not sulphur only, but a mixture of a certain modification of sulphur with a compound containing both sulphur and carbon. This modified form of sulphur by mere subdivision gives a blue color to the substance used to subdivide it, and there appears to be little doubt that ultramarine simply consists of a basis of colorless silicates impregnated with blue sulphur, resulting from the sodium sulphide formed in the ordinary course of manufacture. As blue sulphur in a state of isolation is unstable, and quickly passes into the yellow variety, it is easy to understand that on decomposing the colorless base by means of an acid, the sulphur itself undergoes change, and ultramarine as a pigment ceases to exist. Mr. Krapp suggests that this same modified form of sulphur may play a part in the production of vulcanite, and that the blue color of certain blast-furnace slags may be due to it. In any case, sulphur which boils at a temperature far above 440 C., whose vapor is colorless, which oxidizes to sulphur dioxide without visible combustion, and which itself is moreover blue, is a body sufficiently remarkable to warrant further research.

— It is more than probable, says *Iron*, that the Egyptains were in the habit of transporting vessels overland across the Isthmus of Suez, and tradition records that twenty-three centuries ago a true ship-railway, with polished granite blocks as rails, existed and was worked across the Isthmus of Corinth, where the construction of a ship-canal has been projected. In 1718 the well-known Count Emanuel Swedenborg constructed a road and "machines" for carrying laden vessels from Stromstadt to Iddefjord, in Sweden, a distance of fourteen miles across a rough country, and the successful use of this work by Charles XII. during the siege of Frederikshall led to Swedenborg being regarded not only as a national benefactor, but as a mechanician of no mean ability, for at least a century after his death.

— The census of British India was taken on Feb. 26 by nearly a million enumerators. According to the London *Times*, the population was found to be nearly 286,000,000, of whom 220,500,000 live in British territory, and 65,500,000 under feudatory governments. The increase during the past decade has been 26,000,000, or 29,000,000 if newly acquired districts be included. The density of population is 474 to a square mile in Bengal, 442 in the North-western Provinces, and 248 in Madras. In Sind the growth of population has been very marked. Burmah has also made rapid progress, owing to the abundance of land ready for new settlers, and Lower Burmah is now as densely peopled as Portugal. As regards the towns, Calcutta now stands first and Bombay second, but changes in town areas and errors in the preliminary report render it impossible to give an accurate comparison of urban populations at present.

— An interesting report, by Mr. Campbell, of the British Consular Service in China, has been issued by the British Foreign Office. According to *Nature*, it is the record of a journey of over 1,300 miles in districts in northern Corea, many of which have never before been visited by Europeans. Mr. Campbell started from Seoul, the capital, and crossed the peninsula to the treaty port of Won-san (Gensan), and thence pursued his way along the east coast around Broughton Bay, whence he turned north-eastward, crossing the Yalu River to Päik-tu-San, known to Europeans as the Long White Mountain, and already visited by Messrs. James, Fulford, and Younghusband. The return journey was partly over the same ground, but on arriving at Won-san Mr. Campbell recrossed the peninsula, and so made his way to Seoul. Besides the ordinary record of this journey Mr. Campbell gives a great amount of information on various subjects connected with Corea. The chief amongst these is a most interesting section on the prevalence of Buddhism in the peninsula, and one on the agriculture and productions. He gives a good deal of information in regard to the geography of northern Corea, and also of the gold production of the country. That Corea contains gold-bearing strata has long been known through the export of gold-dust from the ports, but from Mr. Campbell's report it appears that gold-fields do exist in considerable numbers, and that some of them are worked with the imperfect native methods. There seems no doubt that, if circumstances were favorable to the proper scientific working of the Corean gold-fields, the country would be one of the principal producers of the precious metal in the world. Education in the country seems to be at a very low ebb, and is confined to a knowledge of Chinese. All energy and enterprise is crushed out by an all-pervading tyrannical officialism, and poverty and squalor are universal.

— O. C. Charlton, late of Ottawa, Kan., has been appointed professor of natural sciences in the Texas Normal College at Denton.