calls attention to another drawback, in occasional fog formed in a closed room where acetylene is used. This he thinks is due to the deposition of carbon as the hydrogen of the acetylene burns, thus creating a sort of mist. It will require some ingenuity to overcome all these difficulties, but we cannot doubt but that it will be accomplished in the near future; as it is, the progress of acetylene has advanced much more rapidly than any other form of artificial illumination.

The most serious problem in the generation of acetylene on a small scale is the after-formation of gas in the generator. This is discussed by P. Wolff in the *Metallarbeiter*, and reproduced in the *Chemical News*. According to Wolff this after-generation is due to three causes: the action of the residual water contained in the pores of the carbid, the condensation of water on the surface of the carbid, and the absorption of aqueous vapor. In an experiment where the carbid reservoir was over petroleum, the after-generation was 6 liters in 24 hours, 16 liters in three days and remained constant at this figure. Over water 25 liters were given off in one day, and 30 liters in three days. The generation of gas continued at five to six liters a day until the carbid in the generator was completely decomposed. This shows the danger in small generators where there can be no large reservoir. In large apparatus a gas reservoir can be attached which will have capacity to hold this generated gas and that without compression, which would render it dangerous. The best device is spoken of as being that of Münsterberg, which not only has a relatively large reservoir, but a device for closing the carbid chamber by an air-tight valve which completely shuts off the chamber when the apparatus is not in use. No mention is made of the device which has been used in this country, where the carbid is dropped in small lumps into water. As each piece is exhausted a new portion is fed automatically.

Professor R. Stavenhagen, of Berlin, has described in the *Berichte* the properties of tungsten, which have been, heretofore, only imperfectly studied in impure specimens of the metal. The tungsten was obtained by reduction of the oxide by aluminum. It is found to be practically insoluble in acids, even in aqua regia; it dissolves slowly, however, in fused caustic potash. It is decidedly hard, of a color slightly darker than that of zinc, and is infusible in the electric arc.

According to the *Chemical News* of August 18th, Professor Dewar, at the Royal Institution, had just succeeded in obtaining hydrogen as a solid, glassy, transparent mass. Further particulars of this interesting discovery will be eagerly looked forward to.

J. L. H.

THE NEW COLLEGE PRESIDENTS.

On this subject the *Educational Review* for September comments editorially as follows:

"Four of the most important college presidencies to which we made reference some time ago have been filled, and so satisfactorily filled that it is a matter for rejoicing. It seems to us that Presidents Hadley of Yale, Harris of Amherst, Faunce of Brown, and Wheeler of California were the best selections possible, taking into account the peculiar traditions and problems of each of the four institutions and the personal equation of the man chosen to preside, we hope for at least a quarter of a century, over the teaching body of each. Three of the four men are successful and experienced teachers, and the fourth is a clergyman whose teaching instinct is very strong and whose relations to education have been very close. In these elections the recently exploited newspaper theory that a large college needs a business man or a money getter for President has received a set-back and a severe rebuke. We can imagine few things worse for higher education in the United States than to have the spirit of commercial trading and the business man's point of view obtain strong foothold in it. 'Business methods' have debauched and are debauching politics on every hand, and the treasure house of education must be protected from their inroads at all hazards. The idealism which American life so sorely needs must be furnished in large part by the universities, and the two last questions for their governing boards to be taught to ask are, Is it 'timely'? and, Will it pay?

"Moreover, the typical business man cannot, in the nature of the case, be successful in such a post. His standards of success are the reverse of educational. Underneath the temporary appearance of external prosperity which such a president might bring, there is almost certain to be the dry rot of educational neglect. The more important the college or university, the more surely it needs expert educational supervision. For this there is no possible substitute. Like a city school system, a college or university needs someone in its administration who knows and understands its educational activity in every part, who can distinguish real teaching from sham teaching, and the force of whose personal inspiration will be felt in every department. Those who remember the administration of President McCosh of Princeton, well understand what this means.

"The four new presidents are men of this type. They are men of strong personality, and each will leave his mark for good upon the institution which has honored him. All four are, in a large sense, men of affairs, and may be expected to relate their institutions more closely than ever to the life and thought of the time. This new impulse is particularly needed at Yale, where what we believe to be an unfortunate and dangerous policy of educational isolation has long been pursued. To overcome that isolation, and to restore Yale to its legitimate place as a progressive educational influence are likely to be two of the most noteworthy achievements of President Hadley's administration."

THE PROTECTION OF BIRDS.

THE Commissioner of Education, of the Public Schools, of the State of Rhode Island, Thos. B. Stockwell, has issued the following circular:

TO THE SCHOOL OFFICERS AND TEACHERS OF THE STATE OF RHODE ISLAND:

I desire to call your attention to the efforts now being made in this State by the Audubon Society for the preservation of our native birds. From reliable statistics it is evident that unless some active measures are speedily taken, their number will be very much reduced and some varieties will become extinct.

The value of the birds, from various points of view, is incalculable. As a protection to the farmer against the ravages of countless forms of insect life, as a source of joy and satisfaction to every lover of nature, they minister both to our material and our æsthetic interest. Indeed, it was not till within a few years that the Department of Agriculture, through a long course of accurate observations, determined beyond a question the economic value of almost every native bird in his relation to the various forms of vegetation; and it is no longer debatable whether the inroads of certain pests destructive to certain forms of vegetation are not due quite largely to the scarcity of the birds.

As any improvement in this matter must be brought by imparting more correct information about the birds, it is evident that the public schools, and especially those of the country sections, afford the most effective means for the dissemination of the facts, and the awakening of a life interest in the protection of bird life. The new movement towards Nature Study, which has recently been manifested and is spreading quite rapidly through the schools, furnishes the natural channel by means of which instruction and information on this subject may be readily brought before the children, and through them to the people generally.

The more our children are brought into the right touch with nature, and especially with such beautiful creatures as the birds, the more certain it is that their minds and hearts will be filled with right sentiments and feelings, and that their characters will be moulded aright.

To that end then I bespeak your cordial interest in this general subject, and your coöperation with the plans of the Audubon Society for the protection of our feathered friends.

THE COMPANIONS OF POLARIS.

PROFESSOR W. W. CAMPBELL, of Lick Observatory has made the following statement in regard to his discovery that Polaris or the North Star is a triple system:

The observations of Polaris were made with the Mill's spectroscope attached to the thirty-six-inch telescope. From the well-known principle of the shifting of the lines in the spectrum of a star, we can determine whether the star is approaching or receding from the observers and how rapidly. For most stars the velocity is constant. For some stars the velocity is variable, due to the attractions of companion stars.

The recent observations of Polaris at Lick Observatory show that its velocity is variable. It is approaching the solar system now with a