quoting Locke's complaint as to the neglect of the mother-tongue; and he has returned to the theme again and again. At Harvard he has built up an English department that has been a stimulus to every other college and to schools of all grades.

In this vast enterprise, President Eliot himself, the moving spirit, has had neither the authority nor the will to force the action of faculties or committees. More than once he has seen his opinions thrown into the arena of open debate and voted down. But, convinced that his views, if sound, will ultimately triumph, he has waited with Olympian calm for the march of events. Though the immediate effect of the changes has in some cases seemed to be chaos, he has never been discouraged; he has shown that, to rearrange a curriculum, to train competent instructors in new subjects, to establish traditions of mental discipline, will be the task of generations yet to come.

In his discussion of public questions he has insisted upon the right of the individual to attain his highest intellectual and moral development, unchecked by a cast-iron regimen of studies, or by intolerance in church or state. His criticisms of organized labor have voiced the conviction of our sanest publicists, that 'democracy must profoundly distrust the labor union's too frequent effort to restrict the efficiency and the output of the individual workman.' This doctrine of individualism, a tenet of the liberals of the old school, is falling into temporary decay; it is opposed by certain captains of industry, who want to crush out the individual and pile merger upon merger; it is opposed by the trades unionists, who condemn all laborers to the lock-step; yet President Eliot has steadily, with candor and courage, striven for the basic principle of our Declaration of Independence.

These are the achievements, these the qualities that have won him, year by year, a wider recognition; have transmuted cold respect into affection. In the earlier days of his presidency a reserve of manner, absorption in details of administration, and a frank indifference to the gusts of undergraduate sentiment made students regard him with an uncomfortable awe, as if he were a sort of Iron Chancellor in an empire of education, or—to recur to a former comparison—as if he were really a glacier. Time has proved the falsity of this first impression; has shown that no college president has endured with more serenity and good-humor the criticism of his colleagues; that the springs of his kindness are as unfailing as the waters that melt from the eternal ice. He has reached the goal of his ambition. In describing Dr. Asa Gray's life as 'happy,' he declared: "It is the greatest of human rewards to be enfolded, as years advance, in an atmosphere of honor, gratitude and love." That greatest of rewards President Eliot himself has reaped in full measure, while his eye is not dim nor his natural force abated.—*New York Evening Post.*

## *NOTES ON INORGANIC CHEMISTRY.*

### WATER GAS IN THE CHEMICAL LABORATORY.

A PAPER was recently read before the Society of Chemical Industry by Masume Chikashige and Hitoshi Matsumoto on the defects of uncarburetted water gas as a fuel for laboratory use. Inasmuch as water gas is more or less extensively used in cities and as small local water-gas plants are easily installed, extended studies of its use have been made by the authors, resulting in its condemnation. Among the reasons given for these conclusions are the following, which seem most important.

While the water-gas flame is non-luminous and always powerfully reducing, it is often desired to have a smoky flame temporarily, which is impossible with this gas, nor is it possible to produce a flame to any considerable extent oxidizing in its nature. The air openings in a Bunsen burner are useless, as it is not possible to mix more than a very slight proportion of air with the gas without producing an explosive mixture. The intense heat of the flame, far higher than can be obtained with coal gas, is not an unqualified advantage, as it occasions the rapid destruction of wire gauze and copper vessels; copper air baths and water-baths are rapidly destroyed, unless provided with cast-iron bottoms. Owing to the presence of carbon monoxid, nickel vessels are quickly corroded, some crucibles being burnt completely through in a single

operation. Platinum vessels are seriously damaged, becoming brittle, and at the same time increasing in weight, owing to the deposition of iron from the iron carbonyl formed in the passage of the gas through iron pipes. A similar deposit, which can not be wiped off, is formed on the bottom of porcelain crucibles, precluding the use of such crucibles in quantitative analysis. It was found that a very considerable quantity of unconsumed carbon monoxid escaped into the air, so that this could easily be injurious to health. In a laboratory where thirty coal-gas burners may be kept going without detriment to health, hardly eleven water-gas burners can be used with impunity. In the ensuing discussion of the paper it was suggested that where the water gas is carburetted, as is usual in this country, it is probable that it is less objectionable as a laboratory fuel.

YELLOW ARSENIC.

THE yellow modification of arsenic, which has been observed by several chemists, has been submitted to a careful examination by Erdmann and Unruh, and their results are published in the *Zeitschrift für anorganische Chemie*. The yellow arsenic corresponds to white phosphorus, and is produced by rapidly cooling the vapor of arsenic. In practice the best method was found to be sublimation in a tube of aluminum in an atmosphere of inert gas. The fumes are cooled rapidly by absorption in carbon bisulfid, in which yellow arsenic is soluble. When a saturated solution is cooled to $-70°$ it deposits the yellow arsenic in the form of a yellow powder, which can be preserved at this temperature without change if kept in the dark. When exposed to light, even in solution, it is rapidly changed to ordinary arsenic. After a time a brownish-red precipitate is formed in the carbon bisulfid solution which seems to be a fourth modification, and reminds one of red phosphorus. The molecular weight of the yellow arsenic was determined, and the molecule corresponds to $As_4$.

COPPER CYANID SOLUTIONS.

IN the same journal is a paper by F. P. Treadwell and C. v. Girsewald on the colorless solution of copper cyanid, which is not precipitable by hydrogen sulfid, and which is very familiar to all students of qualitative analysis. The compound present in this solution is variously given in different text-books, some considering it merely a double cyanid of bivalent copper and potassium, as $K_2Cu(CN)_4$, while others affirm that the copper is present in univalent form, being reduced by the potassium cyanid. For this the formula $KCu(CN)_2$ is sometimes given. In both cases it appears wholly a matter of mere conjecture. The authors studied solutions containing various proportions of copper and potassium cyanid, and arrived at the conclusion that the salt present is $K_4Cu_2(CN)_6$, though the salt itself was not isolated. The complexity of the ion which is not decomposed by hydrogen sulfid was determined to be $[Cu_2(CN)_6]^{iv}$, by the use of cryoscopic methods.

CORROSION OF IRON WATER MAINS.

AN interesting case of corrosion is reported from Frankfurt in the *Zeitschrift für angewandte Chemie*, by Martin Freund. This pipe contained in places holes as large as the palm of the hand. On the edges of these holes the iron had been converted into a dense, dark gray, soft mass resembling graphite. Analysis showed the mass to be composed of ferrous phosphate, ferrous silicate, carbon, and ten per cent. of metallic iron. As the surrounding soil could not have supplied the phosphorus or silicon, it appeared that all the materials had come from the iron itself. By the action of stray electric currents the phosphorus and the silicon of the iron had been oxidized to phosphate and silicate. In order to test this supposition, Freund subjected a portion of the cast iron of the pipe as anode to the action of an electric current in a dilute salt or gypsum solution, and found that in a short time the iron became coated with a deposit containing phosphate and silicate of iron, and in every respect resembling the corrosion product of the pipe. J. L. H.

*A QUARTERLY ISSUE OF THE 'SMITHSONIAN MISCELLANEOUS COLLECTIONS.'*

THE Smithsonian Institution has commenced the publication of a Quarterly Issue