similar system, their atomic weights should be as follows:

Atomic Number	Atomic Weight
3	7
5	11
7	15
9	19
11	23
13	27
15	31
17	35
19	39

There is here again the remarkable fact that with one exception these are the atomic weights of the odd-numbered elements. The general formula for the odd-numbered elements may be expressed as $nHe' + H_3'$. From the numerical standpoint it will be seen that the system here proposed corresponds to the formulas found for the atomic weights by Rydberg in 1897. He found that most of the atomic weights can be expressed by $2m$ or $2m - 1$, where m is a whole number.

The proposed structure for the 26 elements of low atomic number is presented in Table III. While it is not meant that in every minute detail this table is necessarily correct, very strong evidence has been found for its validity as a general relationship.

WILLIAM D. HARKINS
UNIVERSITY OF CHICAGO

(To be continued)

SCIENTIFIC EVENTS

CHEMICALS AND WAR IN ENGLAND

PROFESSOR W. J. POPE, addressing a meeting of teachers at the Regent-street Polytechnic on October 6, according to a report in the London *Times*, said that Germany prepared for war by the establishment of a huge chemical industry, which was built up about the coal-tar industry, and then by exporting a very large proportion of the world's requirements of coal-tar colors, and pharmaceutical and photographic products.

That success was achieved in spite of the fact that England once possessed the whole of the heavy chemical industry of the world. We formerly produced practically all the nitric and sulphuric acids, and the greater part of the alkali used throughout the world. That had been taken from us as the result of Germany's foresight and exploitation of scientific ability. The coal-tar industry was established originally in this country. Until ten years ago Germany was practically dependent on us for crude coal-tar, and for the simpler first products separated from coal-tar.

Alluding to the establishment of the department for scientific and industrial research with an endowment of £1,000,000, Professor Pope said: The question we want answered is why that experiment was not made twenty years ago, at a time when it would have been undoubtedly successful in preventing the horrors of the last three years? We have suffered in the past from the exclusively British method of making the specialist entirely subservient to the administrator, the administrator being generally chosen because he is available, because he is politically acceptable, and because he knows nothing whatever about the subject which is to be administered and is therefore not likely to be prejudiced by any previous convictions. That process of appointing someone who knows nothing, to supervise the work of some one who does know how to do the job, seems to have been at the bottom of a great many of our misfortunes in the past.

Even in 1915 the government applied this same method to reestablish the coal-tar industry in this country. An organization was established in which all the people in control were men who knew nothing whatever about chemistry or science, and naturally enough the government organization has proved not only a great failure, but has had the further effect of inhibiting the reestablishment of the coal-tar industry. That is to say, the organization apparently was to do everything that was necessary, and consequently private effort was to a considerable extent hampered, and could not get on with the important problem of reestablishing this fine chemical industry.

Such prevalent, but entirely mistaken, activity arises, I think, from a lack of education. If it were generally demanded that no person should be regarded as decently educated who had not mastered the rudimentary principles of natural science and of scientific method, this farce, staged for the amusement of the whole world, in connection with this coal-tar color question, would have been impossible.

The law had absorbed a great proportion of the youth of the nation who were most fitted for a scientific career. The young man who was capable of advancing knowledge, either in science or in any other branch of learning, must be taught to regard it as his duty, not to use his abilities simply for the sake of acquiring an easy and comfortable position in life. Above all, we must prevent the young man of the type I have named from going into such a blind alley occupation as that of the law, with the ultimate prospect of quitting the world, having left nothing behind, and having made no contribution whatever to its progress.

Professor Armstrong, who presided, declared that the present position of chemistry in this country was deplorable, owing to government ignorance and indifference. The Board of Trade had, advisedly and of set purpose, it would seem, put all scientific advice aside, and had taken measures which had not only proved a failure but which had actually retarded the development of the dyestuff industry. The government seems to be bent on putting us back, body and soul, into the hands of the Germans, in so far as the higher interests of chemistry are concerned.

FACULTY CHANGES AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

At the Massachusetts Institute of Technology the faculty changes have introduced some new problems since there has been so much demand by the U. S. government and by industrial corporations related to the war for men of technical skill. So great has been this draft that in the department of electrical engineering one third of the staff has been called away, in mechanical engineering a dozen men have gone into war work while civil engineering, chemistry, naval architecture and the other departments have sustained serious losses. On the other hand, the demands for instruction have not only not decreased, for the registration is but slightly less than normal with much the same distribution through courses, but are to a considerable extent greater, for the institute is furnishing instruction in academic and engineering lines to the schools of aeronautics for the army and the navy, and is carrying on no less than three schools for deck officers and the school for marine engineers.

Changes already announced include the retirement of Professor Charles R. Cross, with the title of professor emeritus, and the appointment of Professor E. B. Wilson, of the department of mathematics, to the chair of mathematical physics and head of the department of physics. Professor C. L. Norton has been appointed professor of industrial physics, and Dr. Charles R. Mann has been appointed professor of education and educational research.

The following is the list of promotions:

Instructor A. L. Goodrich to assistant professor of mechanical drawing and descriptive geometry; Instructors F. L. Hitchcock and Joseph Lipka to assistant professor of mathematics; Instructor H. P. Hollnagel to assistant professor of physics; Instructor R. E. Rogers to assistant professor of English; Assistant A. B. English to instructor in machine tool work; Assistant W. T. Haines to instructor in electrical engineering.

The special lecturers and teachers thus far named are, William S. Franklin in physics and electrical engineering, Eliot Putnam in architectural history, Charles R. Gow on foundations, Edward F. Rockwood on concrete design, and T. W. Sprague on electricity in mining.

The appointments of new men to places in the institute instructing staff include: In civil engineering, James B. Newman to be assistant. In mechanical engineering, Robert DeCourcey Ward, DeWitt M. Taylor, to be instructors; Chester A. Rogers, Andrew J. Ferretti, John A. Lunn, Paul Hatch, and H. C. Parker to be assistants. In mining and metallurgy, Frank H. Ellsworth and William A. Wissler, to be assistants. In architecture, Paul W. Norton to be assistant. In chemistry and chemical engineering, John B. Dickson,