ations of matter. The problem of matter was not solved before that of electricity was undertaken. Indeed, through the study of this variation in matter we came to appreciate that in it lay the path to the understanding of the atom. Will this experience now be repeated? Will a variation in the electron, not accounted for by electrical laws, be found, and will an investigation of that phenomenon lead to knowledge of the electron and thus of the atom?

I now desire to direct the attention of the younger members of the Society to two significant points that are illustrated by the material in this lecture. The first is that a problem may be too difficult for a direct attack, and one may need to await discoveries which furnish new and unsuspected clues. Röntgen rays were not discovered for the purpose of studying atomic structure. Neither was such a purpose the cause of experiments which led to the discovery of radioactivity. Thus the scientific worker can never know the future importance of his own work. His motive should be to follow up the most promising clues with which he is favored and to trust that all he accomplishes will be worthy of his effort.

The second point is suggested by the fact that most of the methods of attack here mentioned are comparatively new and probably will never become part of laboratory technique taught in a university curriculum. Method in scientific research is fundamentally not a thing to be learned by graduate or research students. For scientific research is nothing more than the successive application of complete acts of thought to experimental and theoretical problems. One needs but to think and to act.

G. W. STEWART
STATE UNIVERSITY OF IOWA

METHODS OF RESUSCITATION

IN line with its campaign to reduce the number of deaths in the mines of the United States, the Federal Bureau of Mines some time ago appointed a committee of eminent physicians and surgeons to develop an efficient method of resuscitation to be administered by miners or other persons to a fellow-workman overcome by electric shock or by gases in places which can not be reached by a physician or surgeon in time to save life.

As a result of this committee's report just made, the Bureau of Mines, through Director Joseph A. Holmes, recommends the following procedure in rendering first aid to those in need of artificial respiration.

The recommendations apply not only to men who are overcome by electric shock or gases in mines, but also to persons suffering from the effects of illuminating-gas poisoning or from electric shock anywhere. The recommendations are, therefore, of importance to many thousands of workmen:

In case of gas poisoning, remove victim at once from the gaseous atmosphere. Carry him quickly to fresh air and immediately give manual artificial respiration. Do not stop to loosen clothing. Every moment of delay is serious.

In case of electric shock, break electric current instantly. Free the patient from the current with a single quick motion, using any dry non-conductor, such as clothing, rope, or board, to move patient or wire. Beware of using any metal or moist material. Meantime have every effort made to shut off current.

Attend instantly to the victim's breathing. If the victim is not breathing, he should be given manual artificial respiration at once.

If the patient is breathing slowly and regularly, do not give artificial respiration, but let nature restore breathing unaided.

In gas cases, give oxygen. If the patient has been a victim of gas, give him pure oxygen, with manual artificial respiration.

The oxygen may be given through a breathing bag from a cylinder having a reducing valve, with connecting tubes and face mask, and with an inspiratory and an expiratory valve, of which the latter communicates directly with the atmosphere.

No mechanical artificial resuscitating device should be used unless one operated by hand that has no suction effect on the lungs.

Use the Schaefer or prone pressure method

of artificial respiration. Begin at once. A moment's delay is serious.

Continue the artificial respiration. If necessary, continue two hours or longer without interruption until natural breathing is restored. If natural breathing stops after being restored, use artificial respiration again.

Do not give the patient any liquid, until he is fully conscious.

Give him fresh air, but keep his body warm.

Send for the nearest doctor as soon as the accident is discovered.

The members of the committee reporting to the Bureau of Mines are as follows: Dr. W. B. Cannon, chairman, professor of physiology, Harvard University; Dr. George W. Crile, professor of surgery, Western Reserve University, Cleveland, Ohio; Dr. Joseph Erlanger, professor of physiology, Washington University, St. Louis; Dr. Yandell Henderson, professor of physiology, Yale University; and Dr. S. J. Meltzer, head of the department of physiology and pharmacology, Rockefeller Institute for Medical Research.

AWARDS OF THE JOHN SCOTT MEDAL

The city of Philadelphia, acting on the recommendation of The Franklin Institute, has awarded the John Scott Legacy Medal and Premium to Elmer Ambrose Sperry, of New York, N. Y., for his gyro compass. On battleships under action, the shifting of large masses of magnetic material precludes the use of the magnetic compass, and even on ordinary iron vessels, the material of the ship and its disposition must be compensated for. The gyro compass is entirely non-magnetic and is unaffected by the proximity of iron. For some years Mr. Sperry has devoted practically his whole time to overcoming the numerous physical difficulties involved in the adaptation of a gyroscope to a ship's compass in the place of a magnetic needle. He has been able to make an instrument which automatically corrects for the speed and direction of the vessel, and which is unaffected by the rolling of the ship in a heavy sea. His compass may be made in the form of a master compass which may be made to actuate secondary or repeater compasses mounted in any desired part of the vessel. On naval vessels, such an arrangement is very desirable, as the master compass may be installed behind heavy armor plate and protected from damage, and may still be available when all the secondary compasses are destroyed.

An award of the John Scott Legacy Medal and Premium has also been made to Arthur Atwater Kent, of Rosemont, Pa., for his "unisparker." The unisparker is an essential element of the Atwater Kent Ignition System for automobiles, and consists of a contact-breaker, governor and distributor, arranged in one structure. The contact-breaker is in the primary of a non-trembler coil circuit and is so designed as to be operative only when the engine runs in one direction, thus preventing backfiring. The governor automatically advances and retards the spark according to the requirements of the engine. The distributor is in the secondary circuit of the coil and distributes the sparks to the several cylinders. All the parts of the device are especially designed for durability. The contact points are of tungsten and are of large area. The current in the primary circuit can be reversed at will, changing the polarity of the contacts and preventing their disintegration.

PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES

In January, 1915, the National Academy of Sciences will begin the publication of Monthly Proceedings. The members of the editorial staff, with the fields of science represented by them, are:

Astronomy: E. B. Frost, Yerkes Observatory, Williams Bay, Wis.

Mathematics: E. H. Moore, University of Chicago, Chicago, Ill.

Physics: Henry Crew, Northwestern University, Evanston, Ill.

Chemistry, Biological and Organic: J. J. Abel, Johns Hopkins University, Baltimore, Md.

Chemistry, Physical and Inorganic: A. A. Noyes, Mass. Inst. Tech., Boston, Mass.

Geology: H. F. Reid, Johns Hopkins University, Baltimore, Md.

Paleontology: Charles Schuchert, Yale University, New Haven, Conn.