

sewage and water, chlorine being especially effective.

The application of this method to swimming-pool water was tried, with the result that hypochlorite of lime in quantities sufficient to give one part available chlorine to two million of water gave efficient sterilization. The pool when so treated remained practically sterile for four days, during constant use. No odor or taste from the chemicals was noticeable. How often such treatment need be applied must vary with local conditions.

Probably for the ordinary swimming pool, if these experiments are borne out by experience, the addition of hypochlorite of lime, in the proportion of one part available chlorine to two million of water, twice a week, would insure a practically sterile pool.

A New Device for the Isolation of B. coli: W. F. WELLS, Massachusetts Institute of Technology.

A laboratory device was described which combines certain advantages of both dextrose broth and lactose bile. It consists of two Durham tubes (the first containing an enrichment medium, as dextrose, the second a selective medium, as bile) so connected by a capillary that the production of gas in No. 1 immediately causes a flow into the bile tube. As the capillary leads from the upper part of the inverted inner tube in No. 1, further increase in gas lowers the liquid below the mouth of the capillary and the flow cuts itself off.

If water containing *B. coli* is put into the dextrose tube the non-motile and aerobic bacteria remain outside the smaller inner tube, while *B. coli*, swimming continually in search of a better medium, finds its way around; so it is likely that such organisms will reach the portion about the mouth of the capillary very soon. With every advantage they multiply rapidly, and in a few hours the inverted tube contains a seething culture of vigorous *B. coli*, and gas forms quickly. The change in level causes a flow into the bile tube, just at the time of most vigorous growth, and then cuts itself off. The bile now contains an almost definite measure of thriving *B. coli*, probably in pure culture. Under these definite conditions the quantity of gas produced should be regular, and the per cent. formed in a given time after the first tube ferments significant.

The tubes are handled almost as simply as ordinary tubes. They are clamped together; a small test tube is hooked into the short leg of the capillary, while the longer legs straddle into

both large tubes. They are made up and sterilized as usual, filling upon cooling.

The double medium secures the advantages of both. It does more; it preserves *B. coli* at its most favorable stage, the moment of gas production, and inoculates the bile under definite conditions with a dose of healthy organisms. It may be reasonably expected that the gas formers which are accustomed or can accustom themselves to the digestive tract will be indicated. Practical results show no unexpected error in the reasoning, and as far as they go promise an efficient test.

NORMAN MACLEOD HARRIS,
Secretary

UNIVERSITY OF CHICAGO

SOCIETIES AND ACADEMIES

THE PHILOSOPHICAL SOCIETY OF WASHINGTON

THE 677th meeting was held on February 26, 1910, Vice-president Abbot in the chair. The following paper was read:

The Recovery and Discussion of the Earliest Magnetic Observations along the Antarctic Continent and in the Approaches to the South Magnetic Pole: Mr. G. W. LITTLEHALES, of the U. S. Hydrographic Office, Navy Department.

The results were chiefly in a chart of terrestrial magnetic lines for the epoch 1840, representing the inclination and the declination of the magnetic needle founded upon the observations of the United States exploring expedition which discovered and traversed the coast of the Antarctic continent in about 66° of south latitude between the 160th and 97th degree of longitude east of Greenwich, in the beginning of the year 1840.

The observations presented have but lately been recovered from among a part of the records of the exploring expedition of which all trace was lost for many years, and they have resulted in the portrayal of a passing state to which we could not otherwise have reascended.

Such magnetic lines from original observations made long ago have a value which increases with the lapse of years on account of their importance in elucidating the changes which time works in altering the magnetic state of the earth.

The interpretation of the results proves that American explorers were the first to point out the region of the south magnetic pole by disclosing its presence, at that epoch, as an area of considerable extent, over which the dipping needle stood vertical or nearly vertical, around a position in 68° 50' of south latitude and in longitude 135° east of Greenwich.

Dr. W. J. Humphreys, of the U. S. Weather Bureau, then spoke informally on "Solar Disturbances and Terrestrial Temperatures."

The speaker's purpose in this paper was to bring harmoniously together, as cause and effect, some solar and terrestrial phenomena.

The sun being the source of practically all of the radiant energy we receive, any change in its surface that affects its radiation must, through the resulting modification of the energy received, also affect certain terrestrial phenomena, some of which are of vital importance.

The speaker briefly discussed the relation of the changes in the number and extent of sun-spots, flocculi and coronal streamers to such terrestrial phenomena as auroral displays, magnetic storms, temperature changes and plant growth, and pointed out how some of these relations may be explained.

The following conclusions were reached in reference to the relation of changes in sun-spots and auroral discharges to terrestrial temperatures:

1. An increase in sun-spots appears certainly to be accompanied by a decrease in terrestrial temperatures fully twenty fold that which can be accounted for by the decrease in radiation from the spot areas alone.

2. It seems nearly certain that sun-spot maxima, whatever the value at such times of the solar constant, must lead to a decrease in the ultra-violet radiation that reaches the earth, and a corresponding decrease in the production, by this method, of ozone in the upper atmosphere.

3. The increase in the auroral discharges that accompany spot maxima tend to increase the amount of ozone.

4. The change in temperature of the earth, and all its train of consequences, from spot maximum to spot minimum, is not necessarily dependent upon a change in the solar constant. It may depend largely, if not wholly, upon a change in the absorptive property of the atmosphere, caused, we believe, by a variation in the amount of ozone produced by ultra-violet radiation and by auroral discharges.

THE 678th meeting was held March 12, 1910, President Woodward presiding. Two papers were read:

Recent Work on Primary Triangulation in the Southwest: Mr. WM. BOWIE, of the Coast and Geodetic Survey.

After having completed the primary triangulation along the 98th meridian, in 1907, it was

decided to extend the scheme from the 98th meridian, in central Texas, westward to the Pacific coast. This area in the southwest section of the country was badly in need of a control upon which to base surveys and engineering work.

It was originally intended that the portion of this scheme in the state of Texas should run along the Rio Grande River, from Brownsville to El Paso. This plan was abandoned owing to many difficulties which would have been encountered. The route used starts from the 98th meridian in the vicinity of Weatherford, and follows the Texas and Pacific Railroad across the state of Texas to El Paso, thence across the southern portion of New Mexico, Arizona and California to the Pacific coast triangulation in the vicinity of San Diego.

The reconnaissance for this scheme of triangulation, 1,224 miles in length, was done by a party under Mr. Bowie's direction, in four months and twenty-one days. The scheme consists of 92 primary and 38 secondary stations.

From Fort Worth to the Pecos River the land is rolling and very similar to that along the 98th meridian in Texas. From the Pecos River westward to the Pacific coast the country is mountainous with some peaks as high as 11,000 feet.

Upon the completion of the reconnaissance in February, 1908, the preparation of the stations for observations was begun at the eastern end of the line. Two seasons of observing have been completed, one of five months and three days, and one of four months and fifteen days; a total of nine months and eighteen days. The work done during those seasons was 72 primary stations occupied and completed, 12 primary azimuths observed and two base lines measured. The bases were about thirteen and fifteen kilometers in length. Six hundred and twenty-three miles of triangulation along the axis of the scheme were completed. The party doing this work was under the direction of Assistant J. S. Hill, except for two months of the first season.

The results show that the completed triangulation is of a grade equal to that of the best half of the primary triangulation previously done in this country.

Three fifty-meter nickel-steel (invar) tapes were used for measuring each base, and they gave very satisfactory results. Eight primary bases have been measured with invar tapes by the Coast and Geodetic Survey, during the past four years. These tapes hold their lengths well between standardizations. As a result of the use in the field,

no one tape has changed its length during any one season by as much as one tenth of a millimeter, or one part in 500,000.

A long step forward was made in geodesy when it was found that a primary base could be measured with steel tapes. But especial care had to be exercised with steel on account of the large coefficient of expansion, and all measurements were made at night. A second important advance was made in substituting nickel-steel tapes on account of their very small coefficient of expansion.

The observing on the Texas-California line of primary triangulation will be resumed in July of this year.

Field Observations in Iceland: Dr. F. E. WRIGHT, of the Carnegie Institution of Washington.

This paper dealt with the observations of a six-weeks' trip in Iceland by the speaker in the summer of 1909, especial attention being given to the physiographic and geologic features of the island and their influence upon the development of the country as a whole. The area of Iceland is about 40,000 square miles, and has about 6,000 miles of coast line. Its present population is about 90,000 people, largely an urban population. Iceland was settled by the Norseman in the ninth century, and for the first three hundred years thereafter it had a republican form of government. It is now a dependency of Denmark, but is largely self-governing.

Most of the houses in the country districts are built of peat, but in the towns corrugated iron is the chief material of house construction. The chief exports of Iceland are fish, eiderdown and ponies, many of the latter being used in the coal mines of England. 30,000,000 pounds of fish were exported from Iceland in 1901, most of which went to Spain.

Geologically, Iceland is a very young country, and for volcanic and glacial study it is the best region in the world, and affords the best idea of geologic forces. Iceland is a region of high seismicity and of much local magnetic disturbance.

R. L. FARIS,
Secretary

THE ANTHROPOLOGICAL SOCIETY OF WASHINGTON

At the 443d regular meeting of the society, held March 1, Mr. William H. Babcock presented a paper on "The Two pre-Columbian Norse Visits to America." So far no reliable evidences of Norse visits have been found on American soil, which is, however, not surprising in view of the great lapse of time, the small number of the

visitors and the short duration of their sojourn. The records of the Norse visits are found in the saga of Thorfinn Karlsefin and the nearly identical saga of Eric the Red. The Flattoy book adds to the number of voyages, exaggerating many of the improbable features, and in other respects exhibiting signs of later development and corruption.

The lecturer gave an exhaustive survey and analysis of the sagas, subjecting their geographical, ethnological, historical and other data to a thorough and searching criticism. In conclusion, he said: "It seems clear that America was discovered. In addition we may be pretty safe in fixing on the neighborhood of the Bay of Fundy as the chief temporary home of Thorfinn's party in Wineland; and in following his route from Greenland thither, and later around Cape Breton into the Gulf of St. Lawrence and back to Straamfirth about as given. All else remains still open to discussion and more or less probable conjecture."

Mr. A. P. Bourland followed with an address on "The Study of Culture History in German and American Universities." The speaker gave a description of the "institutes" for the study of culture history established at some German universities. Such an institute is equipped with a series of libraries illustrating the development of the human race in all its aspects and directions, such as industry, arts and crafts, politics, jurisprudence, religion, etc. The creator of these institutes was Professor Carl Lamprecht, of Leipsic, whose conception of history is: The study of the development of human life on its economic and social sides.

At the 444th meeting of the Anthropological Society, held March 15, Dr. Elnora C. Folkmar gave a lecture on "Education; Some Examples among Primitive Peoples." The field covered extended from Australia to Africa. The point brought out by the speaker was that among primitive peoples imitation and object lessons, as it were, take the place of methodical and theoretical teaching and training. The children unconsciously imitate the practises and doings of their elders and thus successively acquire what knowledge they have and need for life.

In the discussion Dr. J. R. Swanton called attention to the specialization in training among the Indians of the coast. Thus the Creek Indians have a kind of graded course of study, especially for the medicine men, with some sort of graduation marks by some insignia, such as a fox's skin,

the feather of a buzzard or owl. Mr. J. N. B. Hewitt pointed out that among the Iroquois education does not stop with childhood. The adults are trained in the knowledge of the tribal laws and customs and in what may be called inter-tribal law and diplomacy, such as the treaties and pacts entered by the tribe with other tribes, as also in the elaborate ritual connected with certain tribal events, such as the installation of new chiefs. Dr. J. W. Fewkes dwelt on education among the Hopi Indians.

I. M. CASANOWICZ,
Secretary

THE AMERICAN CHEMICAL SOCIETY
RHODE ISLAND SECTION

The regular meeting of the section was held February 24, 1910, at the University Club, preceded by the usual informal dinner.

Mr. C. E. Swett, of Providence, R. I., presented the paper for the evening on the subject "Field Notes from the Natural History of Silica." Mr. Swett first outlined the source and mode of formation of rocks in general and then took up the strictly silica rocks such as quartz, flint, etc. Finally he described the silica rocks containing metals, telling the chemical processes leading up to their formation, and showed a large number of specimens taken from various mines visited by him during the summer of 1909.

ALBERT W. CLAFLIN,
Secretary

PROVIDENCE, R. I.

THE AMERICAN CHEMICAL SOCIETY
NORTHEASTERN SECTION

The ninety-seventh regular meeting of the section was held at the Massachusetts Institute of Technology, Boston, on March 4.

Dr. Daniel F. Comstock, of the Massachusetts Institute of Technology, in an address on "The Present Conception as to the Constitution of Matter," briefly outlined the recent advances in the field of atomic and subatomic chemistry and physics, describing some of the brilliant experimental work that has marked these developments. There is a reasonable basis for believing that the atom has a real existence and is something more than a helpful fancy and also that the atom itself is a very complex structure.

Mr. M. C. Whitaker, of the Welsbach Co., Gloucester, N. J., described the monazite sand deposits of Carolina and Brazil, the methods of

monazite mining and purification, and the preparation therefrom of the rare earths, with particular reference to the nitrates of thorium and cerium. The manufacture of gas mantles was described in some detail and there was indicated the probable lines along which improvements in mantles are likely to occur.

F. E. GALLAGHER

THE AMERICAN PHILOSOPHICAL SOCIETY

At the meeting of the society on March 18, the following paper was read by Dr. Jay F. Schamberg, of Philadelphia: "On Vaccination and on the Ravages of Smallpox among Royal Families." The speaker sketched the incidents of the discovery of vaccination by Jenner in 1798 and referred to the great importance of this discovery to the world. In the seventeenth and eighteenth centuries smallpox was an ever-present and death-dealing scourge, causing, it is estimated, 400,000 deaths a year in Europe. The visitations of this disease were severe in many royal families, particularly the Bourbons, the Hapsburgs, the Stuarts and the House of Orange. Since the discovery of vaccination, royalty appears to have been exempt from smallpox. Had vaccination been discovered a century earlier, the destinies of certain European countries would doubtless have been altered.

The address of April 1 before the society was delivered by David Fairchild, agricultural explorer in charge of foreign seed and plant introduction, U. S. Department of Agriculture, on "A New World for Exploration." With the origin of the term agricultural explorer it was recognized by the department that there is in the study of the botanical relatives of our cultivated plants a new world to explore. The botanical explorations of the past have been mainly for the purpose of classifying in a general way all the plant species of the world. Now that the possibilities of plant breeding are more fully recognized, the great importance of getting together the relatives of our cultivated crop plants has become very apparent. The importance was emphasized by the speaker of getting, before it is too late, the strains or races of well-recognized economic species which have been selected for centuries by cultivation in isolated mountain valleys, desert oases and oceanic islands. The rapid spread of railways and ocean travel and its accompanying seed exchange threaten to soon swamp these varieties, many of which may be of the greatest value to civilization.