tion of an iodine molecule may consist in its dissociation and the ionization of one of the parts by the same electron impact.

This kind of a process has been suggested to estimate the heat of dissociation of hydrogen from ionization data, but the present work is the first, as far as we are aware, to give direct evidence as to which ionization effect is due to the atom and which to the molecule. It is probable that this method may be of value in determining heats of dissociation which are too high to be found by ordinary methods.

K. T. Compton,
H. D. Smyth

Princeton University,
May 18, 1920

THE AMERICAN PHILOSOPHICAL SOCIETY

At the 1920 general meeting of the American Philosophical Society, held on April 22, 23 and 24, in Philadelphia, the following comprehensive program was followed.

April 22, 2 o'clock

William B. Scott, D.Sc., LL.D., president, in the chair

Beach protection works: Lewis M. Haupt, Philadelphia.

Geographic aspects of the Adriatic problem: Douglas W. Johnson, professor of physiography at Columbia University. (Introduced by Professor W. M. Davis.)

The reefs of Tutuila, Samoa, in their relation to coral reef theories: Alfred G. Mayor, director of the department of marine biology, Carnegie Institution of Washington.

A distribution of land and water on the earth: Harry Fielding Reid, C.E., Ph.D., professor of dynamic geology and geography, Johns Hopkins University. The conception of the land of the earth as being a deeply dissected and loosely joined together mass, with its center about half way between the equator and the poles, explains nearly all the characteristics of the distribution of land and water, such as: the antipodal relation, the concentration of land about the north pole and of water about the south pole, etc.

Thyroxin: E. C. Kendall, Ph.D., of the Mayo Clinic, assistant professor of chemistry of the University of Minnesota. (Introduced by Dr. Philip B. Hawk.)

The dualistic conception of the processes of life: Samuel J. Meltzer, M.D., LL.D., head of department of physiology, Rockefeller Institute for Medical Research, New York. Animal life manifests itself by an uninterrupted stream of various forms of activities. But each of the activities is discontinuous, it is interrupted by a longer or shorter resting phase. Most physiologists look at life processes from a monistic point of view. In their opinion only action needs a cause; the reduction in action or the resting phase needs no special interpretation; they are simply due to a reduction in the extent of the cause or to its entire absence. However, seventy-five years ago, it was discovered by the brothers Weber that stimulation of the peripheral end of a vagus nerve stops the beating of the heart which remains resting in an increased state of diastole. Here a special cause, a stimulation of a nerve going to a muscle, causes a resting phase in the heart muscle. This action was termed inhibition. In the three quarters of a century since this discovery was made, numerous instances of inhibition in the various processes of animal life were discovered. From all the facts as they are known now, it must be assumed that there is in the animal life probably not a single function in which the phenomenon of inhibition is not an important factor. The part played by inhibition is on one hand to remove obstacles to an efficient action, and on the other hand to permit the living tissues to perform in the resting phase anabolic processes, that is, to build up the tissues or to replenish the material expended during the action phase. The dualistic conception of the life processes may be presented as follows. Irritability is a characteristic property of all living tissues. Irritability means the property of the tissues to react with a change in each state to a proper stimulus. The change may consist in an excitation, an increase of activity, or an inhibition, a decrease in activity. Each and every state of life of the plain tissues or of the complex functions is a resultant from the combination of the two antagonistic factors, excitation and inhibition. In a state of utmost rest the factor of inhibition prevails greatly; but there is still a remnant of the factor of the excitation which permits the tissues or the functions to remain in a state of tonus, of dormant life. On the other hand, in a state of extreme excitation there is still a remnant of the factor of inhibition which prevents the excitation from completely destroying the life of the involved tissues.

The relation of the bacillus influenza: FRANCIS G. BLAKE, M.D., associate in medicine, Hospital of the Rockefeller Institute for Medical Research, New York. (Introduced by Dr. A. C. Abbot.) Following Pfeiffer's discovery of *Bacillus influenzæ* in 1892 this organism was rather generally accepted as the probable cause of influenza, and of a characteristic type of bronchopneumonia which complicates influenza. Pfeiffer and others failed to support this possible etiological relationship by animal inoculation experiments. During the recent pandemic the causal relationship of *B. influenzæ* to the primary influenza has been seriously questioned and in general the organism has been relegated to the position of a secondary invader responsible for a variable proportion of bronchopneumonias complicating influenza. Because *B. influenzæ* is constantly present in the respiratory tract in uncomplicated influenza and in a characteristic type of bronchopneumonia following influenza, it seemed desirable to determine by animal experiments whether influenza and this type of bronchopneumonia could be produced by inoculation with pure cultures of *Bacillus influenzæ*. Twelve monkeys were inoculated on the mucous membranes of the nose and mouth with the successful production of an acute self limited respiratory disease closely resembling influenza. This disease was complicated in five cases by sinusitis, in three by bronchopneumonia. The pathology of the pneumonia was identical with the pathology of the pneumonia ascribed to pure infection of the lungs with *B. influenzæ* in man. Ten monkeys were inoculated in the trachea with pure cultures of *B. influenzæ* in man. Ten monkeys were inoculated in the trachea with pure cultures of *B. influenzæ* with the production of the same type of bronchopneumonia in seven cases. These experiments establish the etiological relationship of *Bacillus influenzæ* to the type of bronchopneumonia with which the organism has been found constantly associated in man. They also prove that *Bacillus influenzæ* can initiate an infection of the upper respiratory tract and produce a disease that closely resembles influenza, and that is complicated by the same complications as influenza. They do not prove that *Bacillus influenzæ* is the primary cause, however, since it is impossible to determine whether the disease produced in monkeys with *B. influenzæ* was actually identical with pandemic influenza.

X-rays of the brain after injection of air into the ventricles of the brain and into the spinal canal: W. E. DANDY, M.D., associate in surgery, Johns Hopkins Hospital. (Introduced by Dr. Keen.)

Celt and Slav: J. DYNELEY PRINCE, Ph.D., professor of Slavonic languages, Columbia University. Slavs and Celts are strikingly similar to each other in habits of mind and expression although far removed geographically. The Russians, Poles, Czecho-Slovaks, Serbo-Croatians and Bulgarians all speaking Slavonic idioms, although racially very various have certain marked traits in common which they all share with the Celts; viz., the Irish, Scottish and Manks Gaels and the Armorican Bretons of France, and the Welsh still Celtic speaking, and the Cornish, whose Celtic language is now extinct. The similarity between Slavs and Celts is twofold, viz., temperamental discontent and morbid joy in sorrow. As a concomitant of this discontent goes the spirit of quest after the unattainable, which is manifest in both Slavonic and Celtic trends of thought. Success plays almost no part as an element of heroism in Slavonic literature and comparatively a small rôle in Celtic. Both Celt and Slav are not satisfied with the present world, and care more for sympathy than for accomplishment. In Russia, especially, the public sympathy has been with the unsuccessful rather than with the successful hero. Morbid pleasure in failure, delight in a "lost cause," love of the appurtenances of death are all common and underlying Slavonic and Celtic traits. These characteristics are instructive as accounting for the "political impossibility" of the easternmost and westernmost branches of Indo-European language-influence. The sun of common sense has never risen on either the Slav or the Celt and it is doubtful whether the Slavs can exist very long without the guiding hand of strangers. The charm of the Celt and Slav is great and durable, but it is charm and not character, feeling and sentiment rather than thought and reasoning, which dominate the east and west of Europe alike.

A new theory of Polynesian origins: ROLAND B. DIXON, Ph.D., professor of anthropology, Harvard University. (Introduced by Dr. W. C. Farabee.) The question of the racial origins of the Polynesian peoples has long attracted the attention of anthropologists. Previous studies have dealt mainly with small portions of the area, and have not satisfactorily correlated the various factors characterizing physical types, nor the Polynesian types with those of the rest of Oceanica. The present study seeks to secure more satisfactory results by including the whole of Oceanica and eastern Asia in its scope. Following a method differing from those previously employed, a number of fundamental physical types are defined, and their distribution and that of their derivatives traced.

One of these fundamental types unexpectedly proves to be Negrito; the other two most important ones being Negroid and Malayoid. The Negrito and Negroid types being marginal in their distribution, are probably the older.

The Zoroastrian doctrine of the freedom of the will: A. V. Williams Jackson, professor of Indo-Iranian languages, Columbia University. The purpose of this paper was to show the signficance of the doctrine of the freedom of the will in the dualistic creed of Zoroaster more than two thousand five hundred years ago. The warring kingdoms of good and evil, light and darkness, personified as Ormazd and Ahriman, the ancient Persian god and devil, are in perpetual conflict, according to Zoroaster's philosophic teachings. While these two antagonistic principles, which struggle for the soul of man, are primeval and coeval, they are not coeternal, because Ormazd will triumph in the end and Ahriman will be annihilated. Man will help in bringing about the victory. Man is Ormazd's creature and belongs by birthright to the kingdom of good. He is created, however, a free agent, with the power of will to choose right or wrong. By the universal choice of right he will contribute his share towards the ultimate triumph of the hosts of heaven over the legions of hell at the final judgment day, and will win salvation for his soul. It was Zoroaster's mission in the world to guide man to make the right choice. Passages from the ancient Avestan and Pahlavi texts relating to the subject were translated, and emphasis was laid upon the interest which this old Zoroastrian doctrine in regard to the freedom of the will has for students of philosophy and religion.

The Hittite civilization: Morris Jastrow, Jr., Ph.D., LL.D., professor of Semitic languages, University of Pennsylvania. During the last four decades the discoveries and excavations in northern Asia Minor have brought the Hittite problem into the foreground of Oriental archeology. The notices about the Hittite groups found in the Old Testament and in the inscriptions of Egypt and Assyria have been supplemented by an abundance of material now at the disposal of scholars, though this can not be fully utilized until the large quantity of inscriptions in the Hittite characters have been satisfactorily deciphered. Even without this decipherment the monuments themselves tell us much of the important part played by the Hittites during the second millenium before this era in the ancient East. They seem to have been composed of a conglomeration of various ethnic elements and about 1500 B.C. a strong Hittite empire was located in northern Asia Minor which was powerful enough to threaten both Egypt, on the one side, and Babylonia and Assyria, on the other. These Hittites moving along the historical highway across Asia Minor left their rock monuments and their fortresses as traces of the power and civilization which they developed. Their contact with Assyria appears to have been particularly close and it is not impossible that the earliest rulers were actually Hittites. We find that at one time they extended far into Palestine. The "sons of Heth" associated in tradition with Abraham are Hittites and there were Hittite generals in the army of the Jewish kings. The introduction of cuneiform writing among the Hittites to replace their more cumbersome script is in itself an important indication of the close contact with Babylonian-Assyrian civilization as it also furnishes a definite basis upon which the decipherment of the Hittite language becomes a definite possibility.

The decipherment of the Hittite languages: Maurice Bloomfield, L.H.D., LL.D., professor of Sanskrit and comparative philology, Johns Hopkins University.

The beginning of the fourth gospel: Paul Haupt, Ph.D., LL.D., professor of Semitic languages, Johns Hopkins University. John i. 1, should be translated: In the beginning was Reason. Greek "logos" denotes both "word" and "reason." Logic is the science of reasoning. According to the Stoics, Reason (Greek Logos) was the active principle in the formation of the universe. We find stoic phraseology not only in the New Testament, but also in the Old Testament. The most valuable lessons of Stoicism were preserved in Christianity. Arthur W. Goodspeed

(To be continued)

SCIENCE

A Weekly Journal devoted to the Advancement of Science, publishing the official notices and proceedings of the American Association for the Advancement of Science

Published every Friday by

THE SCIENCE PRESS

LANCASTER, PA. GARRISON, N. Y.

NEW YORK, N. Y.

Entered in the post-office at Lancaster, Pa., as second class matter