ON THE INDUCTION OF ANTIRACHITIC PROPERTIES IN RATIONS BY EXPOSURE TO LIGHT

IN the issue of September 5, 1924, of SCIENCE, Steenbock published a communication bearing a title similar to the above. He reported that by irradiation he was able to activate fats which were "otherwise negative in preventing rickets" so that they were rendered active and effected a rapid healing of lesions.

In this connection I wish to call attention to a similar investigation which was reported by me at the meeting of the American Pediatric Society, at Pittsfield, on June 7. These experiments consisted of irradiating various fluids with the mercury vapor quartz lamp. The results were summarized in this paper as follows: "that it was found that cotton seed oil when irradiated for an hour at a distance of one foot had acquired antirachitic properties. In order to exclude the possibility that the effect might be due to an antirachitic potency of cotton seed oil, linseed oil was substituted and the experiment carried out in the same way—0.1 cc. and 0.25 cc. being given daily to each rat. The same result was obtained, namely the development of rickets when non-irradiated oil was fed and the prevention of rickets when the oil was given which had been irradiated."

It may be added that the potency of cod liver oil is also enhanced by irradiation. It will be seen that the experiments which we have reported brought about results in regard to antirachitic actions which are similar to those recently communicated in this journal.

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SCIENTIFIC BOOKS

Effect of Variations in the Assumed Figure of the Earth on the Mapping of a Large Area. Special Publication No. 100 of the U. S. Coast and Geodetic Survey. By WALTER D. LAMBERT, Mathematician, Division of Geodesy.

THE question of how much correction to computed geographic positions would be required in the change from one spheroid of reference to another with slightly different elements of definition is one that must always be considered by the practical geodesist.

This publication attempts to give some idea of the magnitude of such changes from a consideration of an area such as that of the United States. The amount of exact computation requisite even for this general view of the matter is considerable; these computations have been carried out with sufficient precision and they are of value as concrete examples for such as wish to undertake similar calculations.

Heretofore the formulas and explanations of such computations have been scarcely, if at all, available in English. It is therefore with pleasure that we note that this small pamphlet gives the formulas for such work with an explanation that can be followed with ease even by those who may not be actively engaged in such work. The geodetic study of the figure and size of the earth should be of direct interest both to the engineer in a practical way and to the scientist who should take an active interest in the advancement of knowledge along all lines.

A feature of the publication that is to be commended is the table of comparison of symbols used by various authors given on page 35. One of the things that is always discouraging in reading scientific literature is the use of different notations for the same thing by different authors. Not the least of such offenders against clearness are the mathematicians both pure and applied. This table is therefore of great value to those who want to look into this question without too much preliminary study.

Since this publication furnishes authoritative information on some rather intricate questions of geodesy, it fills a place in English geodetic literature that should appeal in a special way to the scientific world.

O. S. ADAMS

U. S. COAST AND GEODETIC SURVEY
WASHINGTON, D. C.

The Evolution of the Universe, or Creation According to Science. Transmitted from MICHAEL FARADAY, late electrician and chemist of the Royal Institution of London. Cosmos Publishing Company, Los Angeles, California, 1924. $2.50.

MICHAEL FARADAY, one of the creators of the science of chemistry and a pioneer in investigations of electricity, died in 1867, at the age of seventy-six.

It will interest chemists and physicists to know that "after transition" to "the scientific spheres of the Spirit World," Faraday has continued his investigations of the "Major Vortex," which is "with other planetary conditions only one state of the Entity," and especially in regard to electrons and the mastery of "the imponderable forces of nature which control the incarnation of a mortal without whose agency the world would roll on for ages in the idealism of the savage types of man and the entities that would be caught in the vortexical currents of the incarnating processes," etc. And all this without once calling on the resources of mathematics, which indicates that formulae and equations are emanations of the material mind.

Without anticipating the discoveries promulgated by the master chemist derived through fifty years of freedom from hampering conditions, I hasten to say that these were presented all or chiefly through "electro-magnetic" "independent slate-writing" to a gen-

tleman in Los Angeles, who chooses to be known as the "Mystic Helper," assisted by a friend, the "Mystic Scribe." The last message received (1911) from Professor Faraday reads:

> Through my cherished instrument I will continue my work bringing to mankind the greatest and most helpful thoughts gleaned from my long experience in this realm of truth.

The book is written in a kindly and tolerant spirit, accepting current theories of evolution, and going a long way farther. It closes with a rhapsody to evolution in which "the mighty soul of the Potent All guides all the worlds their endless rounds." A companion piece is the "Song of the Atom," which lets us down a bit from the "pure-ethered height" of the other poem:

> Come in line my brothers all
> Let us make the Earth a ball.

And a ball it remains to this day!

The volume is illustrated by photographs of nebulae and the like, taken by astronomers, by portraits of Faraday, Tyndall and Franklin, noted physicists, and by a number of spirit photographs not mentioned in the test. Some of these are conventional materializations, but others illustrate the creative work of electrons which in their varied operations appear in irregular forms pure white in color, and about as large as snowflakes. Students of heredity will be interested in the microphotographs showing the "formation of cell by induction of earth's magnetic currents," the process of mitosis being due to their influence. It is remarkable what electrons will accomplish when once released from bondage to "mortal electricians, like Edison, Marconi and many others."

The editor of this volume expresses the hope that Faraday "may be able to continue his efforts until intellectual spirituality animates every soul born into Cosmic Existence in or upon any planet that shall ever exist in Realms of Evolutionary Experience."

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LABORATORY APPARATUS AND METHODS

BLOOD CORPUSCLE MOVEMENT IN THE RETINA FOR CLASSROOM DEMONSTRATION OF CIRCULATORY CHANGES

No doubt many persons, when looking at a dull sky, have observed indistinct faint specks which appear, move in definite pathways across the field of vision and then disappear. Upon suddenly arising from a bending position, or after a sneeze, the specks may become quite bright and distinct. They are the moving blood-corpuscles in the retinal capillaries and their movement is quite different from that of small particles in the humors of the eye, often so troublesome to users of the microscope. Subjective observation of the retinal circulation has been frequently described, but the advantages of the following method for viewing this phenomenon, first recorded by Rood in 1860, are not generally recognized.

Upon looking at a bright sky through a dense blue-violet glass (such as Corning G 585–L), the movement of the corpuscles stands out almost as clearly as in the web of the frog's foot, but the corpuscles are not seen as objects of such definite form nor are capillary outlines visible. One observes bright specks, somewhat elongated, often curved like a vibrio. The whole field of view seems filled with a mass of writhing bacteria, sometimes accelerated in movement corresponding to the heart-beats.

Any brilliant white surface instead of the sky will serve as a background. One may look at the sun itself if additional filters are used, say G 585–L, G 586–A and G 584–J, when the corpuscles appear very bright. It is perhaps well not to gaze at the sun too long, for these filters are quite transparent to the near ultra-violet.

Changes in blood velocity connected with pressure changes are easily observed. Thus, if one suddenly bends over and looks at the sky through the blue-violet glass, the blood velocity is much accelerated; upon straightening up, the flow instantly slows down and then regains its usual rate. By taking a deep inspiration, holding the nose and exerting pressure on the thoracic cavity, the circulation may be seen to slow down and almost stop. The retinal circulation is an index of what is going on in the brain and illustrates the decreased blood-flow which precedes fainting, since fainting frequently follows any prolonged increase in intrathoracic pressure.

By lying on the back and having an assistant suddenly raise the legs, changes in blood-flow due to hydrostatic pressure of blood in the legs, with compensatory after-effects, may be demonstrated. By pressing on the eyeball with the finger, the circulation in the retina may be much slowed or stopped, and the bright specks disappear just before the whole field of view becomes black. On releasing the pressure, the circulation again starts at a rapid rate. Changes of blood-flow due to exercise and many other effects, which will occur to those interested in blood circulation, may be observed with great ease. The simplicity of the method commends it for classroom work, and the student usually takes great interest in viewing for himself blood velocity changes in