DR. LUDLOW J. WEEKS, of the Canadian Geological Survey, Department of Mines, and an assistant, Mr. Maurice H. Haycock, of Wolfville, Nova Scotia, accompanied the 1926 Canadian Arctic expedition as far as Baffin Island and returned on this year's patrol ship. After establishing headquarters at Pangnirtung in 1926 several trips were made around the head of Cumberland Gulf and a plane-table map of Pangnirtung fiord was completed before the 1926–27 winter set in. During the winter and the following spring approximately 2,300 miles were covered by sled and dog team. By this means the party was able to map the northern part of Cumberland Gulf, and in the spring, to investigate the geology and mineral possibilities of the region. Early in May the party moved to Nettilling fiord and, after the break-up in July, a start was made on the journey by water to Nettilling Lake. The party succeeded in carrying a traverse from Nettilling fiord through a chain of small lakes to Nettilling Lake and along the south shore of the latter.

## UNIVERSITY AND EDUCATIONAL NOTES

BY the will of the late Annie Downing Willson, of Cambridge, the sum of $150,000 is left in trust to Harvard University, the income of which is to be used to maintain a professorship of applied astronomy in the university.

THE will of Robert Forsyth, consulting engineer of Chicago, bequeaths $100,000 to the Rensselaer Polytechnic Institute of Troy, N. Y.

THE University of Rochester will receive from the estate of James M. Cutler, former mayor, property valued at $2,407,151, to be used as a permanent endowment. $55,486.41 was set aside by Mr. Cutler for the College of William and Mary at Williamsburg, Va.

DR. G. CARL HUBER, professor of anatomy and histology in the University of Michigan since 1892, has been made dean of the graduate school of the University of Michigan, succeeding the late Professor Alfred H. Lloyd, who died last spring.

DR. A. W. STEARNS has been appointed dean and associate professor of neurology at the Tufts Medical School.

DR. CHARLES ALLEN PORTER, John Homans professor of surgery at the Harvard Medical School, has resigned. Dr. Porter's successor will be Dr. Edward Peirson Richardson, now assistant professor of surgery in the school.

PROFESSOR J. R. DUPRIEST, head of the department of mechanical engineering at Oregon State College, recently accepted a similar position at the University of Minnesota.

DR. L. B. NICE has resigned as professor of physiology at the University of Oklahoma, in order to accept an appointment as professor of physiology at Ohio State University.

PROFESSOR I. M. KOLTHOFF, of the University of Utrecht, Holland, has been appointed professor of analytical chemistry at the University of Minnesota for the coming year. He is to replace Professor P. H. M. P. Brinton, who recently resigned to do private work.

DR. LEON H. STRONG, formerly assistant professor of anatomy at the University of Indiana, has been appointed associate professor of anatomy at the University of Utah School of Medicine. Dr. O. A. Ogilvie (M.D., Penn. '27) has been appointed assistant professor of anatomy and pathology in the same school.

DR. NOEL F. SHAMBAUGH, former fellow in medicine of the National Research Council, upon his return from Berne, Switzerland, was appointed assistant professor of clinical investigation in the department of internal medicine of the University of Michigan.

DR. WILLIAM A. P. GRAHAM, instructor in geology at the University of Iowa, has been made associate professor of geology at Texas Technological College. Dr. M. A. Stainbrook, instructor in the University of Tennessee, has been made assistant professor of geology in the college.

DR. WILLIAM H. ADOLPH, formerly of Chee-Loo University, China, last year at Yale University, has been appointed to an associate professorship of chemistry in the University of Nebraska.

## DISCUSSION AND CORRESPONDENCE

### A SUGGESTION OR HYPOTHESIS CONCERNING THE ZODIACAL LIGHT

THE nature or origin of the zodiacal light is regarded as more or less of a mystery. Some have thought that the phenomenon may indicate the existence of a diffused ring of small particles in equilibrium and in nature somewhat like those of Saturn's rings, though more scattered and existing in very small amount compared thereto.

This hypothesis assumes a stability which it is difficult to accord to such a ring.

If we assume, however, that the coronal streamers from the sun which apparently extend without limit of distance into space, as partly composed of or accompanied by fine particles propelled by the pressure of light, or even of fine solids from condensation

of vapors arising from the solar atmosphere and expanding into a vacuum external thereto, we may form a hypothesis which seems to be consistent with the facts. The fine condensed particles would move into a vacuous space in substantially straight lines and would reach enormous distances from the solar body. As the spectrum lines of iron are prominent in solar light, it might be expected that in the space surrounding the sun fine particles of iron would constitute, in part, at least, those escaping streamers from the solar atmosphere. These particles would surround the earth and be extended in all directions therefrom.

If they be of the same or of similar nature to those which in my experiments are seen to line up in a magnetic field (the observations on the novel magneto-optical effect described in SCIENCE, June 24 and July 29, 1921) then the zodiacal light, which is seen best at places near the equator and at times of vernal and autumnal equinoxes, might be explained as follows: The magnetic field lines of the earth joining

Fig. 1.

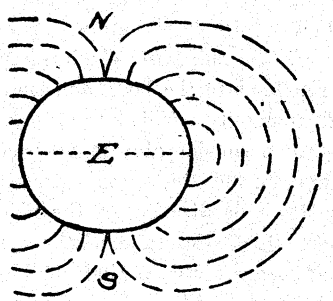
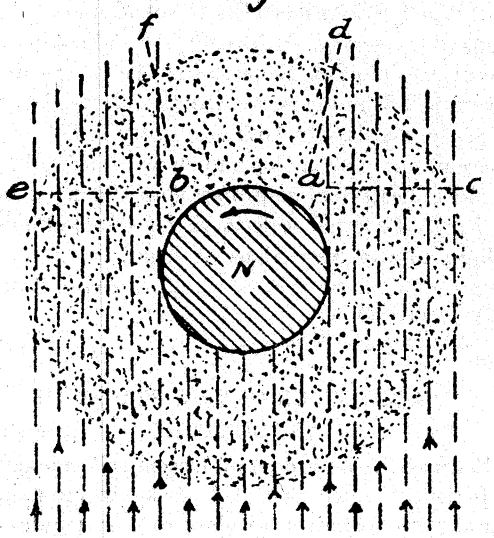



Fig. 2.




the north and south areas outside the earth would, at the equator, lie sensibly parallel to the earth's axis but at a great height, on the average, above the surface of the earth. This is illustrated in the subjoined figures, which indicates the general trend of the earth's magnetic field (one side only) all around the earth in the space about it.

The dots in Fig. 2 do not represent floating particles, but are intended to show only that if one could look at a pole of the earth from a great distance and see a section through the equatorial plane, the lines of force of Fig. 1 might be indicated as dots in the equatorial plane. Now, let the sun's rays be from below, it will be seen that they intersect the direction of the magnetic lines at nearly right angles. Now, further, let us by some means render visible in the polar beam the magnetic field about the earth, it will become apparent that it will be best seen by observers after twilight at night and before twilight in the morning—best at the time of the equinoxes and best in the tropical night. On the average the observer placed at about *a* or *b* looking upward, will be well placed for such observation and the column of light will extend from *c* to *d* on the evening side, and from *e* to *f* on the morning side, or over an angle of about 60° altitude, more or less.

It may, therefore, appear as a plausible hypothesis that the luminous effect known as the zodiacal light or the "Gegenschein" may be of the same nature as that observed in the combination of magnetic field, light beam and iron smoke from an arc, as described in 1921 in SCIENCE, as above. If the zodiacal light is polarized in the same way as the light from the iron smoke is polarized and undergoes the same variations by variations in the direction of viewing it, these circumstances might assist in identification.

There has been no opportunity to make any observations on this point. As the luminosity of the zodiacal light is low, although coming from a great depth of space around the earth, there would not need to exist for producing the effect more than an exceedingly small density in the iron particles concerned, a density perhaps millions of times less than in my original experiments on the magneto-optical effect. It has been shown also that the orientation which is the cause of increased luminosity in the light beam is producible by a very weak magnetic field. That the direction of viewing is transverse to that of the light beam, and that the magnetic field lines are transverse both to the directions of viewing and light beam, are significant facts. More and varied observations and experiments are certainly warranted in this fascinating field.

It will be seen that the hypothesis presented does

not require any ring formation around the earth. It requires only that the general space surrounding the sun and planets contain an exceedingly small density of diffused iron particles, capable of being affected or oriented when in the magnetic field surrounding the earth, in which case they reflect the light of the sun to observers on the earth who are in favored relation to them. Moreover, it may well be that the magnetism of the earth would tend to concentrate such iron particles, if any, in the space around it. If we have found a clue to the observed effects, further observations and investigations may confirm or oppose the hypothesis presented.

ELIHU THOMSON

LYNN, MASS.

## THE PHYSICS QUADRILATERAL

ONE of the joys of a teacher in a university is the weekly colloquium or departmental meeting in which by cooperation he is able to keep fairly well informed as to the work that is being done in his special line. In the average American college, however, where the teachers are few and the duties numerous, a weekly or even a monthly colloquium is hardly practicable. Especially is this true in a subject like physics, where a considerable mathematical equipment is necessary, and consequently the reading of an average article in a physical journal is laborious and often impossible for a college student. So his contribution to a colloquium is nearly negligible and most of the burden falls on the professors. The natural result is that the colloquium idea is given up and the few members of the physics staff despair of being able to keep in touch with what is going on.

To remedy such a condition in this vicinity the following plan was adopted two years ago: The teachers of physics in the four colleges, Mount Holyoke, Smith, Massachusetts Agricultural and Amherst, established "The Physics Quadrilateral." President Olds, of Amherst, who had studied under Helmholtz, Kirchhoff and Quincke, was added to our membership. The first meeting was held at Amherst and was addressed by Dr. Gladys A. Anslow, of Smith. A discussion followed and then refreshments. Other meetings were held in rotation at intervals of about a month at the other colleges. The Quadrilateral's only officer is a secretary, and the program is usually arranged by the department of the college at which the meeting is held. The feature of one of our recent meetings was an address by Professor Louis V. King, of McGill University, on "The Gyromagnetic Electron and a Classical Theory of Atomic Structure and Radiation." The final meeting of the first year took the form of an excursion to the high-tension laboratory and plant of the General Electric Company at Pittsfield.

It is scarcely necessary to add that The Quadrilateral is a source of benefit and pleasure to all its members, and this communication is written that other colleges similarly situated may pool their resources and reap similar reward.

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AMHERST COLLEGE

## THE POISONING OF HONEY BEES BY COMMON ORCHARD SPRAYS

RECENT studies made by the Massachusetts Agricultural Experiment Station have indicated that there is little danger of significant mortality of honey bees from the spraying of orchards, provided that the recommended combination of lead arsenate, lime-sulfur and nicotine sulfate is used.

In laboratory tests, bees were strongly repelled by this regular spray combination (lead arsenate, 1½ lbs. to 50 gals.; lime-sulfur, 1:40; and nicotine sulfate, 1:1,000). This mixture, however, even when consumed in minute amounts, proved to be very toxic to them and was rapid in its killing action. Lead arsenate spray was readily accepted. A one-frame nucleus to which this was offered lost approximately one half of its bees within forty-eight hours after feeding. Any mixture containing nicotine sulfate was very repellent to the bees, and they would feed upon it but sparingly. This strong repellent action persisted for a considerably longer period in the laboratory than in field tests, and appeared to vary according to the volatilization of the nicotine.

Under Massachusetts conditions, the orchard sprays applied nearest the period of bloom are the pink and the calyx. No sprays are scheduled to be made when trees are in full bloom. Neither of these sprays, made when there was considerable bloom on the trees, caused any serious mortality to colonies located in the sprayed orchards. Following the late pink, trees soon came into full bloom; after the early calyx, the bees repelled by the spray doubtless foraged in neighboring orchards. In both cases they found an abundance of unpoisoned bloom upon which to work. This would indicate that improper spraying must be carried out on a large scale to visibly affect colonies not subject to any restrictions of flight.

A. I. BOURNE

MASSACHUSETTS
AGRICULTURAL COLLEGE

## ACOUSTICS IN THE STUDY OF "SOLUTIONS"

WHILE stirring a dose of Epsom salts in water for a patient I noted that if I strike the container (a glass) with the mixer (a glass rod) at regular intervals until the solute is entirely dissolved, each stroke