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

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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.

JOSEPH O. THOMPSON

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

will emit a musical note which at first with each succeeding note will become lower. I usually count four or five notes—less than an octave. When a certain point in the solution is reached the reverse takes place, namely, that the musical notes will become higher and higher until the solute is entirely dissolved or reaches a point of saturation. I repeated the experiment a number of times and found that between the first contact of the above solute with the solvent until solution or saturation has been effected I could distinguish a change in the scale about three or four octaves. Salt, sodium citrate and ammonium chloride will produce the same effect while undergoing solution. Sugar and sodium phosphate does not produce any difference in the musical notes whatsoever.

Further experiments with Epsom salts disclosed, to my surprise and astonishment, the fact that there are in the market two kinds of Epsom salts; one which will emit musical notes during the solution and another will not. Whether there is a difference in the crystalline form of these salts I do not know. It reminded me of the story of Pasteur's work on the asymmetry which characterized the tartrates of many substances. I have demonstrated this phenomenon before many physicians and druggists and none of them, they all assured me, have ever noticed it before.

Have I been the first man to hear these sounds? I dare not presume that this simple phenomenon has never been observed before. I wonder, however, whether the research workers on the subject of "Solutions" have utilized this acoustic phenomenon in their work and whether there is any literature on this subject. The available literature in our public and medical libraries has no reference to this subject. If my observations are correct, then a new field for research is open for investigation.

C. D. SPIVAK

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QUOTATIONS

THE MARCH TO HEALTH

THE decennial supplement of the *Registrar-General* contains a new national life-table for England and Wales. This table is the work of the government actuary, Sir Alfred Watson, and is based on the figures of the population returned in the 1921 census and on the average number of deaths recorded in the three years 1920, 1921 and 1922. The new table confirms the opinion which is generally held, that "the vitality of the nation has been steadily improving." A rough measure of the improvement is afforded by a comparison of the "expectation of life" as indicated in the life-tables of 1906, 1911 and 1921 (the new table), respectively. In 1906 a male child at birth had an expectation of life of 48.53 years. In 1911 the expectation of life at birth had risen to 51.50 years. The new table gives an expectation of life of 55.62 years. The figures relating to female children at birth are, respectively, 52.38, 55.35 and 59.58. It is pointed out in the report that improvement in the rate of mortality is specially marked at the youngest ages. The probability of a child's dying in the first year of life, for example, has decreased by about forty per cent. during the fifteen years between 1906 and 1921. Curiously enough an appreciable deterioration has occurred in the rate of mortality of women between the ages of eighteen and twenty-seven. This deterioration, however, does not affect married women. It may be that, in recent years, young women have been engaging in tasks which impose too great a strain upon their physical constitutions; in any case, it seems possible that woman's place in the industrial and commercial worlds can not be determined solely by woman's enthusiasm to enter and share these worlds. A further commentary on woman's strength as a worker and wage-earner may possibly be afforded by the fact that rates of mortality are invariably heavier among widows than among single women or wives. The report deals at considerable length with mortality in different geographical areas of the country and confirms the prevailing view that the rate of mortality varies both with the geographical distribution of the people and with the density of the population. But of these two the geographical is the preponderating influence. In all the areas examined the difference between the death-rate of county boroughs and that of rural districts is greater among males than among females, but the point is emphasized that this difference does not appear to be due to the greater strain of working conditions to which men are subjected, but to the relatively favorable mortality experience of the male population of rural areas. The healthy conditions of country life, in other words, are enjoyed to a greater extent by men than by women, whereas in towns the two sexes are subjected, as a general rule, to the same kinds of conditions.—*The London Times.*

SCIENTIFIC BOOKS

Fogs and Clouds. By WILLIAM J. HUMPHREYS. Baltimore, The Williams and Wilkins Company, 1926. 98 pp. of text, 93 illus.

OF the text, one may enthusiastically say that if laymen could avail themselves of the privilege of reading Dr. Humphreys's lucid account of how these fogs and clouds come into and pass out of being, of the everchanging play of atmospheric processes that control their everchanging forms, a widespread intelligent interest in them might soon be expected. The book is in its author's best style. There is about