Science Bulletin

Volume 3 | Number 2 Article 7

10-1930

Question Box

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SCIENCE BULLETIN

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Issued Monthly. Entered as second class mail matter at the post-office, Cedar Falls, Iowa, under the act of August 24, 1912.

5c per copy or 35c per year outside of Iowa.

THE QUESTIONNAIRE

The request for suggestions which was sent out with the September number of the Bulletin brought a flood of unexpected magnitude. The editor was quite inundated, and even now has only partially emerged. But it was a welcome flood, which showed clearly what the science teachers of Iowa wish in such a bulletin—wish individually. Collectively they are not in all respects agreed. For example, in response to the question concerning the type of article desired many expressed a wish for content, many for method, and many for both, or as some said, fifty-fifty. In other matters there was also an interesting variety in the demand.

The response also showed that the science teachers of the state are up and coming, alive no less to the opportunities of their respective situations than to the responsibilities.

In their efforts to make the Bulletin serve its purpose as effectively as possible the contributors and management will be greatly aided by the many excellent suggestions received. The number of these is so great that it will be impossible to take advantage of all of them in the course of a single year. However, we shall strive to satisfy as well as possible the most general demand. Incidentally let it be emphasized that the time for suggestions and criticisms has not expired with the return of the questionnaire, but that any such word our readers may have for us will be gladly received at any time.

The readers of the September number were unanimous in their response on one point. "Yes", they said, "continue the question box." That clears the way for us to say that the Box is yours, and that it will be a useful feature of the Bulletin if by your questions and your interest you make it so. Questions received before the end of the month will be answered in the next number of the Bulletin if the necessary wisdom can be found before the time of going to press.

QUESTION BOX

Question:

How can breakage fees be best handled in connection with the high school laboratory sciences?

W. S.

Answer:

First choice. Print breakage tickets carrying one dollar's worth of credit, similar to a meal ticket. Require pupils to purchase these; punch off breakages as they occur; return balance in cash at the end of the course.

Second choice. Check all apparatus out to pupils on an apparatus slip or file cards; keep a record of breakages as articles are returned; require payment at the end of the course and before grades can be awarded.

Third choice. Require a breakage deposit when the pupil enrolls; keep a record of breakages and deduct the amount when returning the balance of the deposit.

Fourth choice. Require that the pupil make settlement at the Superintendent's office at stated intervals, perhaps monthly, and submit the receipt before being allowed to continue laboratory work.

R. W. Getchell.

Question:

Will you describe the method followed by the weather bureau in weather forecasting?

L. G. B.

Answer:

Each morning at 7:00 o'clock Eastern Standard time two hundred weather bureau stations throughout the United States, Northern Mexico and Southern Canada report to Washington weather data which has been collected during the last 24 hours. This information consists of pressure, temperature, conditions of sky, kinds of clouds, wind direction and velocity, relative humidity, forms of moisture and any other information which will be of value in forecasting the weather. All of this information is sent over telegraphic wires in cipher code. After a number of stations have reported, the information is relayed to other stations throughout the country. The forecaster at each forecasting station then locates the high and low pressure centers on a map. He knows on an average, the course these pressure areas take, the rate at which they move and the nature of weather accompanying each. The sky appearances and the indications of local instruments indicate whether a coming or developing low, a coming or developing high is to control the weather. As soon as this is determined, the probable sequence of weather changes for the next 24 hours or 48 hours is at once apparent.

The accuracy of weather forecasting may be considered on about the same level as the practice of medicine. The expert forecaster can diagnose the present conditions of the atmosphere with as much precision as a physician can determine the bodily conditions of his patient.

There are many local factors which may influence the movement of pressure areas such as surface topography, presence of snow and ice, and the surrounding meteorological conditions. If the value and relative importance of these factors could be determined from the study of many weather maps of the entire continent, it would be possible to make very accurate forecasts.

The Weather Bureau Service now makes two types of forecasts, one for 48 hours and one for the week. The 48 hour forecast is the more reliable.

A world study of the sun's radiation is now being made to determine what effect a variation in color radiation may have upon the weather. If this study in the next decade or two proves fruitful it may then be possible to make long range forecasts. A forecast a year in advance at present is worthless.

E. J. Cable.

Question:

When you blow or fan a camp fire it burns the better. When you blow a candle it goes out. What is the reason for the difference?

H. J.

Answer:

The difference in the results is due to the different character of the burning substances. The construction and material of the candle is such that the natural draft of air is the best. When the candle is burning the parafin is first converted into a liquid and then into a gas which continues the burning by coming in contact with the blaze and hot wick. The size of the candle and wick are so proportioned that the air coming in is just sufficient to oxidize the gas produced. Any puff of air blows the gas away from the heated region and brings cold air in its place, and the candle is extinguished.

In the case of the camp fire the burning substance is largely of a solid nature, carbon. It does not volatilize but burns as the air comes in contact with it when it is above its kindling temperature. The natural draft brings oxygen in contact with the heated carbon too slowly for rapid burning. By blowing gently there is a larger quanti-

ty of oxygen provided, hence the increased oxidation. If the blowing were too vigorous, the heat would be blown away and the carbon cooled below its burning temperature and the fire extinguished, just as in the case of the candle.

O. B. Read.

Question:

Should static electricity be continued as a part of the high school physics course?

M. S.

Answer:

By all means. While it is true that electrostatics is of little importance in an elementary study of motors, dynamos and transformers, it is of the greatest importance in other connections, two of which will be mentioned.

In the first place there is nothing in nature more fundamental than an electrostatic charge. Science has reached the conclusion that matter itself, everything material in the universe, consists of nothing else—positive and negative electrons associated together. In the second place electrostatics has in recent years risen to a place of commanding importance in engineering. This has been due chiefly to the development of long distance telephony and radio, in which electrostatics assumes a major role.

W. H. Kadesch.

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Outline for Elementary Physics

(Continued from page 3.)

6. Miscellaneous: glass rod or flask; hard rubber rod or sealing wax; silk cloth; woolen cloth; pieces of fur; corn pith; rectangular support for pith balls suspended from silk threads.

GROUP PROJECTS IN CURRENT ELECTRICITY

Methods of Producing Currents

1. By means of batteries. 2. By means of dynamos. 3. By means of thermo-cells.

Nature of an Electric Current

1. Units of measurement: ampere, volt and ohm. 2. Ohm's law. 3. Calculation of power from volts and amperes. 4. Problems.

Effects of an Electric Current

1. Chemical Effects: Electrolysis of Water and Chemical Salts, Electroplating. 2. Magnetic Effects: Electro-magnet; Applications of the Electro-magnet. 3. Heating and Lighting Effects. 4. Problems.

Current Induction

1. Faraday's law. 2. Lenz's law. 3. Applications of current induction in dynamos, induction coils and transformers. 4. Nature and production of an alternating current. 5. Problems.

Modern Advances

1. X-rays. 2. Radium. 3. Wireless telegraphy. 4. Radio receivers and transmitters.

APPARATUS FOR CLASS INSTRUCTIONS IN CURRENT ELECTRICITY

1. Tumblers; carbon and zinc rods; sulphuric acid; potassium bichromate to illustrate acid voltaic cells; keys.

2. Section of old dry cell to show its structure.

3. Bent glass tube with platinum electrodes to illustrate electrolysis; electroplating.

4. Potassium sulphate solution colored blue with litmus; silver cyanide solution for electroplating.

5. Sections of electrotypes and linotypes to illustrate various ways of printing books and newspapers.

6. Sheet lead for lead plate of a simple storage cell; tumblers and holders for plates with wire terminals.

7. Apparatus and iron filings to show the magnetic field of a current.

8. Solenoid with loose iron core to show the construction of an electromagnet.

9. Apparatus to show the interaction of parallel currents.

10. Electric bells; relay; sounder, keys.