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A Field Trip in General Science

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A more recent and more troublesome obstacle to the simple wave theory has arisen in the action of ultra violet and other short-wave light in detaching electrons from a metal in a vacuum. The energy of thése eltctrons depends not at all upon the intensity of the light but only on its wave length. This shows that light can not be merely a wave phenomenon, but must possess at least some of the characteristics of corpuscles. W. H. Kadesch.

FROM TEACHERS IN THE FIELD

Scrap Books in Science Teaching

Scrapbooks may become a very valuable connecting link between science in the classroom and science in everyday use. Of course to some they are very burdensome but to others they are an efficient means of helping to develop an interest in the subject. During the early part of the course correlate the class room work to outside experiences by means of a bulletin board posted with diagrams, pictures, advertisements, and clippings from various publications available. Enlisting the pupils' help during this time is quite essential. After they see how much material can be found, all that is necessary is to help them each to find an interest in some particular topic, as for example in General Science, development of the automobile; in Biology, a diet for health; in Chemistry, work of Chemistry in medicine; and in Physics, Physics as applied to an auto. The organization and presentation of the material brings out the student's individuality and originality, as perhaps no two will prepare a scrapbook on the same topic.

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A Field Trip in General Science

Yesterday my General Science classes visited the water plant to learn how Iowa City secures and prepares its water supply. In preparation for this I made a preliminary visit to the plant and prepared a skeleton outline, as given below, of the information to be gained. This outline each student copied. Half of this he filled in independently while I was taking the others through the plant, the balance he supplied from explanations I gave as his group visited limeroom, filter and spray. Classes range from twenty-two to thirty-four so a division is necessary. As we left the plant the outlines were collected. They were returned today when we summarized the information, answered questions which arose, and gave each student an opoprtunity to prepare a record of the trip for filing in his notebook.

The plant is eight blocks away but we were able to make the complete trip during our regular class period of fifty-five minutes.

Field Trip to Water Plant
(Student's outline)

I. Source
  A. Seepage wells
    1. Location
    2. Number
    3. Function
  B. Centrifugal pumps
    1.
    2.
    3.
II. Mainroom (To be prepared independently)
  A. Force pump
    1. Parts
    2. Capacity
  B. Pressure
    1. Average
    2. How maintained?
    3. In case of fire—
    4. Permanent record
  C. Testing of water
    1. Bottles for collecting
      a. Size
      b. Number
      c. Covering
    2. By whom?
    3. Frequency
  D. Consumption
    1. Average

2. Summer
3. For fires

III. Limeroom
A. Added to water
1.
2.
B. Purpose
C. Water passes from spray to —

IV. Filter
A. Made of—
B. Function

V. Chlorine
A. ... colored gas
B. How added?
C. Purpose

VI. Storage (clear wells)
A. Location
B. Number
C. Capacity
D. Time required for water to reach them

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PRACTICAL METHODS

(Continued from page 3.)

cell is completely lined with heavy paper. The space between the carbon and the zinc is filled with a mixture of powdered carbon and manganese dioxide. The manganese dioxide supplies oxygen to combine with the film of hydrogen gas to form water and thus, in a rather imperfect way, prevents polarization of the cell.

We have purposely discussed in detail the chemical method of producing a current of electricity in order to provide a basis for a brief comparison of the other two methods with it. The second method of producing a current of electricity for practical purposes is illustrated in the modern dynamo. As the steam engine was the greatest invention of the 18th century, so the dynamo was the greatest one in the 19th century. One wonders what it will be in the present century. The generation of a current of electricity by means of magnetic induction is illustrated in Fig. 2. Here we have represented a powerful horseshoe magnet between the poles of which is fixed a revolving coil of copper wire. As we know, the lines of magnetic force of a magnet pass from the north-seeking to

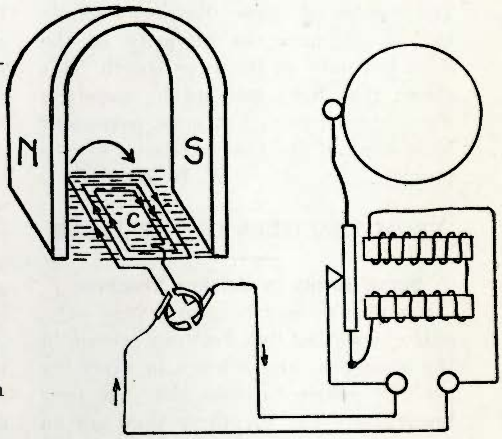

Fig. 2

the south-seeking pole of the magnet. They are illustrated in the figure by dotted lines connecting the two poles of the horseshoe magnet. As the coil revolves, the free electrons, which are always present in a good metallic conductor, are set in motion in a direction opposite to that in which a practical electrician assumes the current to flow. The arrows in the figure indicate the flow of electrical energy from the positive pole to the negative pole of the revolving coil. The positive pole is the end of the coil toward which the free electrons in the wire flow while the negative pole is the end from which the electrons flow when the dynamo is delivering a current to an external circuit. When looking from the north-seeking pole in the direction of the lines of magnetic force toward the south-seeking pole, that side of the revolving coil which is nearest to the north-seeking pole and is rising will have a current induced in it from right to left. The side of the coil nearest the south-seeking pole will at the same time have a current induced in it from left to right. The magnitude of the current