

nature-study affording an unique opportunity for heuristic teaching, the very complexity of the problems which its subject-matter presents puts it at a disadvantage as compared with the simpler problems of elementary physics and chemistry.

Again, how can we reconcile the foregoing quotation with the following, which precedes it by a few pages?

"When a dog has been used as the subject of an observation lesson, the children may read, or be told, about the wolf or the fox. This will lead them to compare and contrast, and will aid in stimulating imagination" (p. 46).

Must we say that the dog is part of "nature" while the wolf and fox are not? or that methods bad for children over ten are allowable below that age? or must we simply explain the difference as due to composite authorship, permissible in a book of suggestions (not instructions), coupled with some confusion of mind on the part of one author between method and subject-matter?

The true idea of the relative positions which heuristic and didactic methods should occupy, which to our mind is well illustrated by the above simple case of the dog and the wolf, is clearly expressed in the chapter on geography:—

"In order that the study of geography may be of real educational value it must not be regarded as a process by which certain facts about the earth . . . are committed to memory. It must be rather regarded as the subject, which above all others brings the youngest child as well as the most advanced student into contact with the outside world. . . . It is true that as we advance in the study of geography we have to rely, to a great extent, upon the investigations of others, but in order that they may understand these investigations we must from the very first teach children to work for themselves and to take nothing for granted."

Nevertheless, it is not suggested that early geographical teaching shall be purely heuristic. On the contrary, the value of stories of strange and distant countries is strongly urged. At first these are scarcely differentiated from fairy-tales, but with each succeeding year they become more exact, until they at length pass into definite geographical teaching for which an observational basis has meanwhile been prepared. Here we see a development of the idea of the relation between didactic and heuristic teaching. It is useless and unnecessary to think, even as a remote ideal, of the exclusion of the former; all that is necessary is to prevent it from being more precise in character than is justified by the stage attained in the latter.

History, in spite of authoritative opinion to the contrary, we must regard as a science, but one in which heuristic teaching is out of the question. Like the one side of geographical teaching, it grows out of fairy-tales, and there need be no scruple in telling young children traditional stories that have not survived modern critical research. But we are glad to see that visits to local places of historical interest are recommended, and that in one at least of the schemes suggested in the appendix the syllabus for the highest class includes "first notions on the materials of history and the use of evidence." Unfortunately, very few teachers will have had any opportunity of acquiring the necessary knowledge on this subject. A book treating in a simple manner of the materials of history—and by no means confined to the documentary portion—is much to be desired.

To sum up the ideas we have so far gathered, we venture to think that in some future edition of these "suggestions" the division into subjects will perhaps be largely abandoned, and in its place we shall have

a division by methods which will by no means coincide with groups of the present subjects. Even the official time-tables may come to recognise this. On the one hand we shall have heuristic teaching, aiming primarily at training the mind in scientific habits of thought, and incidentally imparting knowledge; on the other hand, didactic teaching to impart knowledge which is wanted but cannot be obtained at first-hand—its scope being carefully adapted to the stage reached in heuristic training. But, alongside of these two methods, there still remain a number of other subjects, which do not fall under either of these heads, since they consist in training or drilling of some description, e.g. the use of the mother tongue, singing, handiwork, and health-training. This last, we agree with the writers of the Blue-book, it is not advisable to teach to young children on a physiological basis. Hygienic habits must be learnt before the age at which physiological laws can really be understood, since some knowledge of physics and chemistry is essential to their real understanding; and to attempt to teach them without such a basis is only to give false knowledge, which is only too likely to prevent the acquisition of true knowledge in later years.

A. M. D.

A NEW ULTRA-VIOLET MERCURY LAMP.

UNDER the name of "The Uviol Lamp," Dr. O. Schott, of Jena, is introducing a modification of the Cooper Hewitt mercury vapour lamp, which appears likely to prove useful. The illuminating power of these lamps is very high, and the arc is very rich in ultra-violet rays, but the glass envelope hitherto prevented the passage of many of these actinic radiations. Dr. Zchimmer has recently produced at Jena glasses which are pervious to the ultra-violet rays, and Dr. Schott has made the envelope of the new lamp of this material.

The Uviol lamps consist of tubes of this special glass of 8 to 30 millimetres diameter and 20 to 130 centimetres length. Platinum wires are fused into the extremities, terminating in carbon heads. In the glass tube there is a charge of mercury of 50 to 150 grs., according to the size. The lamps of various sizes, with their resistance and choking coils, can be connected with electric mains of 220 or 110 volts.

To start the arc, the lamp is tilted to a sufficient degree to allow of the mercury in the tube passing from one pole to the other. At the moment of contact between the pole and the mercury, part of the latter is disintegrated simultaneously with the formation of a column of light. The carbon and heads to the poles permit the passage of the current in either direction without fusing the platinum poles. To get the best results from a current of 220 volts the lamp tube must be 130 centimetres long, but two or three suitable shorter lamps may be arranged side by side or one behind or over the other.

The spectrum of the Uviol lamp is exceedingly rich in lines. The lamp is particularly suitable for taking photographs and for copying processes by artificial light. Experiments have also been made in testing by its means if certain colours used in dyeing and printing have sufficient power to resist the fading effects of the sun. It will thus prove of value in rapidly settling the question of the fastness of colours, which will in future require days instead of months.

The Uviol lamp is also a germicide, and it appears likely that it will prove of value in the treatment of certain diseases of the skin. It is an irritant, and easily sets up inflammations, particularly of the eyes, so that the greatest care must be taken by operators

by means of suitable spectacles. With tactful handling it is said that the Uviol lamp can be used for 1000 working hours without loss of efficiency. The cost of a 400- to 800-candle lamp is *id.* to *2d.* per hour. It thus appears to be a very economical method of converting electrical energy into efficient radiating energy of short wave-length.

NOTES.

THE opening of the bridge over the Victoria Falls on September 12, and the visit of the British Association, were celebrated by a banquet, at which Mr. Newton, representing the British South Africa Company, in proposing the health of Prof. Darwin, welcomed the association on the anniversary of the first occupation of Mashonaland by pioneers fifteen years ago, fifty years after Dr. Livingstone first saw the falls. Prof. Darwin proposed the toast of Sir Charles Metcalfe, representing the great enterprise which to-day marks an important step in advance. Reuter's Agency reports that Sir Charles Metcalfe, in the course of his reply, read congratulatory telegrams from Lord Grey and the directors of the British South Africa Company, and a telegram from Mr. Reunert, president of the South African Association of Sciences, conveying his congratulations that more links had been formed in the chain of civilisation. On September 15 the association received a hearty welcome at Salisbury (Rhodesia). The town was decorated, and the trains were met at the station by the local authorities, headed by the Mayor, the Acting Administrator, and the Resident Commissioner. At a subsequent luncheon the Mayor, in welcoming the members of the association to the most northern part of their tour in South Africa, directed attention to the progress made since the occupation of Rhodesia fifteen years ago. When the many diseases which affect the cattle of the country have been conquered, it is hoped that stock-raising will develop very rapidly. In the course of his reply, Prof. Darwin remarked that when the papers and lectures dealing with the special features of South African scientific work are published, it will be seen that serious efforts have been made to grapple with these problems. Sir Thomas Scanlen welcomed the association on behalf of the Chartered Company; and Lord Rosse and Sir William Crookes also spoke. On September 16, at Umtali, a deputation headed by Senhor de Sousa, secretary of the Governor of Mozambique, met the section of the British Association proceeding to Beira. Senhor de Sousa welcomed the members of the association to Portuguese territory in the name of the Governor, the Mozambique Company, and the inhabitants of Beira. On September 17, at Beira, the visitors attended a reception given by the Governor, and were entertained at luncheon. At 4 p.m. on the same day the party left for home on the steamer *Durham Castle*. We regret to learn that Sir William Wharton, a member of the British Association party which is returning home *via* Cape Town, is lying ill at the observatory there, having contracted a serious chill.

FOR the past two years cholera has steadily been proceeding westward, and during 1904 had manifested itself in Asiatic Turkey, Persia, and Russia. Since then cases have been recognised in Germany and Austria, and already 179 cases, with 65 deaths, have been recorded in Prussia. A considerable responsibility, therefore, rests on our frontier guards, the port sanitary authorities throughout the kingdom, particularly in view of the number of aliens

who reach our shores from the region of the infected districts. If cholera unhappily should reach us, it is not likely to cause any serious epidemic. The last epidemics of note in this country were in 1828, 1848, and 1859.

It is announced in the *Bulletin de la Société d'Encouragement* that next month a museum of industrial hygiene will be opened in Paris by the President of the Republic. The creation of the museum was authorised by a decree of December 24, 1904. Accommodation for the museum has been found at the Conservatoire des Arts et Métiers, and the sum of 41,000 francs considered necessary for the installation has been collected, as well as subscriptions to cover the annual cost of upkeep. The exhibition will be a permanent one, and, being a loan collection, will be constantly renewed.

THE sixth congress of criminal anthropology will meet at Turin on April 28, 1906, under the presidency of Prof. Lombroso. An exhibition of criminal anthropology will be held in connection with the congress.

DR. OSCAR MAY died at Frankfort-on-the-Main on August 25 at the age of fifty. Dr. May (says the *Electrician*) was one of the founders of the *Elektrotechnische Lehr- und Untersuchungs-Anstalt* of Frankfort, and was until 1895 instructor in electric lighting at that institution. At the Frankfort Exhibition in 1891 he was a member of the presiding committee and one of the secretaries of the scientific commission.

WE learn from the *Victorian Naturalist* that the estimates recently presented to the council of the University of Melbourne contain, among other proposals of a scientific nature, provision for the erection of a botanical laboratory and the appointment of a professor of botany, who, it is proposed, shall also act as Government botanist. This arrangement, remarks our contemporary, should ensure the best use being made of the valuable collection of Australian plants in the National Herbarium.

A LETTER from Prof. David Todd, dated September 8, informs us that the print of the solar corona of August 30 which was reproduced in last week's *NATURE* (p. 484) was from an early developed negative done during the heat of the Sahara *gibleh*, and was inferior to others developed after the weather turned cool again. He sends us one of these original negatives, which shows a large amount of detail that did not appear in the print reproduced in *NATURE*. The automatic machine with which these exposures were made took about seventy-five negatives during totality, of which sixty-three proved to be useful for executing drawings of the corona.

DURING the past few days earthquake shocks have been felt in various parts of Italy. The following is a summary of Reuter messages published in the daily papers:—*September 13, Innsbruck*.—Severe shock felt in the Arlberg district at 1.30 a.m. Duration, from six to ten seconds, and direction from south to north. *September 14*.—Shock felt at 10.10 a.m. at Raciden, Messina, Reggio di Calabria, and Mineo; recorded on the seismic instruments at all the observatories in Italy. Another shock felt at Reggio (Calabria) at 12.33. *September 15*.—Mount Vesuvius is becoming increasingly active. During the day frequent undulatory shocks were felt in the region around the volcano. The activity of Stromboli is also very remarkable. *September 16, Innsbruck*.—Severe shocks felt in the Arlberg district at 4.3 a.m. and 4.37 a.m. First shock lasted five seconds and the other four. The shocks were accompanied by loud rumblings. *September 17, Monteleone*.—Shock felt at 1.40 p.m.