

time the leech was observed to give out bubbles of air ; and the water of the vessel, when tested by lime-water, indicated the presence of carbonic acid.—The paper is accompanied by drawings of the structures described.

3. “On the Comparative Osteological Forms in the Adult European Male and Female of the Human Species.” By Walter Adam, M.D., Fellow of the College of Physicians of Edinburgh.

With a view to the future investigation of the osteological development of the human race, the author gives, in the present paper, the results of a great number of measurements, which he has very carefully made, of the dimensions of the different bones composing the adult human skeleton. The male bones examined were those in the collection of Dr. Monro ; the female bones were furnished by Dr. Hamilton. The author was anxious to fix on some one dimension in the skeleton which might be taken as the standard of all the measurements : and finding that no bone of the trunk or limbs possessed the requisite characters for that purpose, he sought for it in the cranium ; and the result of an extensive series of observations led him to adopt as the standard of measure the distance between the prolongations of the zygomatic ridges, immediately over the meatus auditorius externus, as being that dimension which was less liable to variation than any other of the human cranium. This line he denominates the *auricular transverse* ; and, adopting a scale of which the unit is the 14th part of this line, being generally about the third of an inch, he states at length, in multiples of this unit, the dimensions, in different directions, of almost every bone in the skeleton ; noting more especially the differences that occur in those of the two sexes. Of these measurements, which are given in much detail, and in many instances arranged in a tabular form, it is impossible to give any abridgement. The conclusion he deduces from his inquiry is, that every bone in the body exhibits certain modifications, according to the sex of the individual.

4. “Some Experiments and Observations on the Combinations of Carbonic Acid and Ammonia.” By John Davy, M.D., F.R.S.

The author was led to the investigations of which he gives an account in the present paper, by finding in the note-books of his brother, the late Sir H. Davy, some memoranda of experiments which he had made on the salts of ammonia, and more especially on the carbonates. The first part of the paper relates to the direct combination of carbonic acid and ammonia, by which a salt is formed possessing singularly alkaline properties. The second is on the sesquicarbonate of ammonia ; a term which Mr. Richard Phillips has applied to that salt of ammonia which is commonly called the subcarbonate, and which is obtained by the mutual decomposition of carbonate of lime and sal-ammoniac, by means of heat. This the author concludes, from his experiments, to be composed of one proportion ammonia, one and a half of carbonic acid, and one of water. He then enters into a comparative review of the analyses of this salt by other chemists, and

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gives an account of the results of his experiments to determine its solubility at different temperatures. He next proceeds to consider the bicarbonate of ammonia, which he finds to consist of one proportion of ammonia, two of carbonic acid, and two of water. He concludes by an inquiry into the effects of heat on the solid sesquicarbonate and the carbonate of ammonia, in which he reviews the experiments and inferences which Sir H. Davy has recorded in his manuscript notes.

5. "On the Influence of Colour on Heat and Odours." By James Stark, M.D., of Edinburgh. Communicated by Sir David Brewster, K.H., LL.D., F.R.S. V.P.R.S. Ed.

The author observes, that the only experiments on record relating to the modifying effect of different colours on the absorption of heat from solar light, are those of Franklin and of Sir H. Davy. In order to investigate this subject, the author employed pieces of wool, silk, and cotton, which were wrapped round the bulb of a thermometer placed in a glass tube: the tube was then plunged into boiling water, and the time which elapsed during the rise of the thermometer from one given point to another was accurately noted. Other experiments were also made with an air-thermometer, of which the bulb was coated with various coloured materials, and heat thrown on the ball by means of polished tin reflectors from an Argand burner. The results accord very nearly with those of Franklin and of Davy; the absorbing power with regard to different colours being nearly uniformly in the order of *black, brown, green, red, yellow, and white*. The author next investigates the differences which occur in the radiation of heat by differently coloured substances; a subject on which he is not aware that any experiments have ever been made previously to his own. The mode of ascertaining the amount of radiation was generally the converse of that by which the absorption of heat had been determined; namely, by exposing the coloured substances, in contact with a thermometer, to cooling instead of heating processes. The general result of all his experiments was, that the loss of caloric by radiation follows exactly the same order, with regard to the colour of the radiating surface, as its absorption.

In the second part of his paper the author gives an account of a course of experiments which he made with a view to discover the influence of colour on the absorption of odorous effluvia, and more especially in the case of the absorption of the fumes of camphor and assa-fœtida by woollen cloth of different colours. Black cloth was always found to be possessed of the greatest absorbing powers, and white of the least; red cloth being intermediate between them. Cottons and silks gave, on trial, precisely the same results, which were further confirmed by the different weights acquired by these substances from the deposition of camphor upon them.