

redetermined the composition of water by volume. By both methods he reaches the same result :  $O=15.879$ , with variation in the fourth decimal place as between the two.

Dr. J. S. Billings and Dr. S. Weir Mitchell have completed the investigations begun by them in 1893, under a grant from the Hodgkins fund, to determine the nature of the peculiar substances of organic origin contained in the air expired by human beings.

In their report the investigators state that for a number of years prior to 1888 the prevailing view among physicians and sanitarians had been that the discomfort and dangers to health and life which had been known to exist, sometimes at least, in unventilated rooms occupied by a number of human beings were largely or entirely due to peculiar organic matters contained in air expired by these persons, and that the increase in carbonic acid due to respiration had but little effect in producing these results, its chief importance being that it furnished a convenient means of determining the amount of vitiation of the air. Recently, however, several experimenters have concluded that the organic matters in the exhaled breath are not harmful, at all events to animals, and the main object of the investigations was to determine the correctness of these conclusions.

The investigators found that the air in inhabited rooms, such as the hospital ward in which experiments were made, is contaminated from many sources besides the expired air of the occupants, and that the most important of these contaminations are in the form of minute particles or dust, in which there are micro-organisms, including some of the bacteria which produce inflammation and suppuration. It is probable that these dust particles were the only really dangerous elements in the air, and it appears improbable that there is any peculiar volatile poisonous matter in the air expired by healthy men and animals other than carbonic acid.

In concluding their report the authors state that the results of the investigations, taken in connection with the results of other researches summarised in the report, indicate that some of the theories upon which modern systems of ventilation are based are either without foundation or are doubtful, and that the problem of securing comfort and health in inhabited rooms requires the consideration of the best methods of preventing or disposing of dusts of various kinds, of properly regulating temperature and moisture, and of preventing the entrance of poisonous gases like carbonic oxide derived from heating and lighting apparatus, rather than upon simply diluting the air to a certain standard of proportion of carbonic acid present.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

MISS HELEN M. GOULD has presented a scholarship of 7000 dols. to Wellesley College.

MRS. S. V. HARKNESS, of New York City, has given 50,000 dols. to the Women's College of the Western Reserve University at Cleveland, Ohio, to establish a chair of biblical literature.

MR. W. C. FLETCHER, master at Bedford Grammar School, has been appointed head master of the High School and Commercial School of Liverpool Institute.

A PARLIAMENTARY paper has just been issued containing a Treasury minute to the effect that the grant to King's College, London, which was suspended by the late Government owing to the retention of denominational tests by the college, shall be continued without any stipulation as regards tests. The college will therefore receive, as from April 1 next, an annual sum of £1700 during the remainder of the term of five years, for which period, beginning in 1894, the grant of £15,000 a year to university colleges in Great Britain was to be proposed to Parliament. The other colleges are also to be informed that the increase in their grants caused by the suspension of the grant to King's College will not be continued beyond the end of this month.

It has been proposed in the Chamber of Deputies (says the Paris correspondent of the *British Medical Journal*) that from the unreclaimed sums of savings banks and other deposit sums to the amount of £10,000 should be paid to the different French laboratories, £2600 to the Pasteur Institute and to the laboratories of higher education in Paris, including the Val-de-Grâce Hospital laboratory and the Alfort School of Veterinary Medicine, for the purpose of aiding researches on contagious diseases, especially those in connection with serums and vaccines ;

£5000 to the medical school laboratories of Lyons, Bordeaux, Montpellier, Toulouse, Lille, and Nancy, likewise to the veterinary schools of Lyons and Toulouse ; also for the purposes of experimental research for contagious maladies, including the further study of serums and vaccines ; and £2400 to the therapeutical, pharmacological, and medical chemistry laboratories of the medical faculties and pharmaceutical schools to be devoted to the study of the methods of treating contagious diseases, likewise of the drugs. Every year reports of the work done at these establishments are to be sent to the Minister of Public Instruction. The Minister will afterwards send them either to the Academy of Sciences or Academy of Medicine.

THE views with reference to training in scientific method, which have been advocated with great persistence by Dr. H. E. Armstrong for some years, are beginning to bear fruit. Mr. A. B. Badger, in a scheme for technical education which he has drawn up for the Carnarvonshire County Council, devotes a section to pointing out the advantages of training in observing, experimenting, and reasoning by practice in the methods of science, and he urges the claims of such instruction to recognition. His remarks are so different from those of technical advisers and organising secretaries of most of the County Councils, that we are glad to quote them. "Throughout life we are largely engaged in exercising the faculties with a view to action. We ought, therefore, as early as possible, to be trained to see things as they are, to compare facts together, and to draw just conclusions ; such training ought to form part of the fundamental education of all. The highest authorities are agreed that habits of observing accurately, experimenting exactly and reasoning logically, are best formed by practice in the methods of science. For years past science has been taught in schools, but far too often the pupils have only been lectured to and shown experiments, or if they have done practical work, it has been a kind which required the minimum of observation and deduction. Primarily, it is not knowledge of the facts of chemistry, or physics, or mechanics, which is wanted, but training in the methods by which these facts were discovered, thus developing the faculties by which, in every occupation of life, the facts necessary to it are ascertained, and their relative values determined." We trust that the suggestions contained in Mr. Badger's carefully-constructed scheme will be adopted by the Local Governors and Headmasters of the County Schools, who will consider them in conjunction with the Technical Education Committee of Carnarvonshire.

SOME of the tables which form the appendix to volume I. of the Report of the late Royal Commission on Secondary Education are of a most interesting and valuable nature. The first of these sets forth the amounts appropriated and spent during the financial year 1893-4 under the Local Taxation Act, 1890. We find the amount available for educational purposes in the counties was £595,838 16s. 6d., of which £448,130 17s. 1d. was actually appropriated by the County Councils for this object, though only £396,143 6s. 2d. was really spent. This sum was disposed of as follows :—Grants to secondary schools, £17,168 17s. 10d. ; to scholarships and exhibitions, £40,047 19s. 6½d. ; to evening continuation classes, £13,921 14s. 10d. ; special classes for elementary teachers, £22,781 9s. 6d. ; technical and art schools and classes, £191,011 13s. 5½d. Of the last-mentioned amount no less than £134,578 1s. 9½d. went to "classes" of one sort and another. The amount available for county boroughs was £152,224 7s. 4d., but owing to the accumulation of funds in the previous years the amount appropriated reaches £158,687 8s. In addition to this, the sum of £8,659 6s. 10d. was raised under the Technical Instruction Act. A consideration of the expenditure in the boroughs brings forcibly under our attention the part that the School Boards are allowed to take in the disposal of the funds, for we find £13,161 8s. was placed in their hands to be dealt with by them. Under the same headings as those used in speaking of county expenditure we find £9,190 17s. 1d. for secondary schools ; £5,444 9s. 10d. for scholarships and exhibitions ; £5,263 7s. 6d. for evening continuation classes ; for technical and art schools and classes the amount reaches £102,147 7s. 6d. of which only £19,645 5s. is spent on more or less detached classes. While Preston devoted none of its share to the purposes of education, and Northampton, Reading, and Great Yarmouth only a part, Coventry, Hanley, Nottingham, Rochdale, Sheffield, and Worcester, not only appropriated the whole of the amounts allocated to them, but also levied rates under the Technical Instruction Act.