molybdenum, uranium and tantalum is reported. Colorado led in the production of tungsten in 1909. The prices quoted for the metal were considerably higher than in 1908, and the production of ore increased from 671 short tons, valued at $229,955, to 1,619 tons, valued at $614,370. This is the largest quantity produced by any country in one year. The United States last year produced nearly one third of the world's total production of tungsten ore, which was about 5,300 tons. Very little nickel was produced in the United States, but a great deal was imported, and, as more nickel is refined in this country than can be used here, large quantities were exported. In all, 22,194,102 pounds of nickel as metal and as metallic content of ores were brought into the United States in 1909. The total value was $3,036,273. The exports of nickel amounted to 12,048,737 pounds, valued at $4,101,976. The importations of cobalt amounted to 12,132 pounds, valued at $11,696. Titanium is being used with great success in making steel rails. The New York Central Line has given rails treated with ferrotitanium a thorough test in the Grand Central terminal yards and now requires that all rails made for its lines shall be treated with titanium alloy. Rutile, or titanium oxide, was produced in the United States last year only at and near Roseland, Va. No rutile was imported, but one American company exported it in considerable quantities. Molybdenum, uranium and tantalum were little used in the United States in 1909, and only a small quantity of tantalum was produced. A little was imported from Germany, but the use of tungsten in incandescent lamps has proved so satisfactory that the demand for tantalum has probably not greatly increased. Although the United States uses 43 per cent. of the world's output of tin, it is not an important producer of that metal. Tin was produced in Alaska and South Dakota in 1909, but not in large quantities. In 1909 there were imported into the United States 47,662 tons of tin, valued at $27,558,546. The average price was 28.91 cents a pound. Several thousand tons of tin are recovered from used tin cans and other wastes.

UNIVERSITY AND EDUCATIONAL NEWS

THE subscription to the memorial to President Grover Cleveland exceeded $100,000 on the seventy-fourth anniversary of his birth. It will be remembered that the memorial is to be a tower forming part of the graduate college of Princeton University.

THE University of Washington at Seattle has received from Messrs. Sigmund and Abraham Schwabacher $30,000 to maintain a bureau of child welfare.

GOVERNOR STUBBS, of Kansas, has vetoed the bill placing the University of Kansas and other state institutions under the control of a commission consisting of three paid members. It is stated that the recent legislature seriously reduced the appropriations for the university.

THE University of the Pacific, College Park, California, by the action of its trustees, will henceforth be known as the College of the Pacific. This action separates the college from a conservatory of music and a preparatory department.

AT the meeting of the board of regents of the University of Minnesota on March 3, the salary of one of the professors, who is dean of one of the schools, was increased from $4,000 to $6,000.

THE cornerstone of the administration building of the William M. Rice Institute, was laid by the trustees on March 2, the seventy-fifth anniversary of Texan independence. The seven members of the board were present. They are: J. A. Baker, W. M. Rice, Jr., J. E. McAshan, B. B. Rice, C. Lombardi, E. Raphael, E. O. Lovett.

HEREAFTER the degree of bachelor of chemistry (B.Chem.) will be conferred by Cornell University on students who have completed the special course in chemistry. The department of chemistry remains a department of the College of Arts and Sciences. A four-year course in chemistry and allied subjects has been offered by the department since about 1903 for students planning to follow chemistry as a profession. Although the course is essentially technical in character and professional in purpose, the degree of bachelor

of arts, has heretofore been conferred upon its graduates.

AT Smith College Harriet W. Bigelow has been promoted to be professor of astronomy, and Frances Grace Smith to be associate professor of botany.

AT Yale University Dr. Alexander Petrunkevitch has been promoted to be assistant professor of zoology, and Dr. Carl Johns, to be assistant professor of chemistry.

DISCUSSION AND CORRESPONDENCE

THE AIR WE BREATHE

TO THE EDITOR OF SCIENCE: As a member of the American Society of Heating and Ventilating Engineers, who had the pleasure of hearing the recent address of Dr. Gulick before that society, I desire to reply to his letter in SCIENCE of March 3. I believe that Dr. Gulick is engaged in a research whose results may be of the utmost importance to the health of a large fraction of the human race—namely, the children in the schools—and it is to be desired that he be given every encouragement to continue in it.

First, to answer some of his questions in regard to the physics of atmospheric air. No one knows "the reason why" raising the temperature of air increases its capacity for holding moisture. It is merely one of the great facts of nature, like gravitation, and like the fact that water freezes at 32° F. At 32° F. a cubic foot of air has the capacity of holding in a gaseous condition 0.0003 pound of water; at 62°, 0.00087 pound, at 72°, 0.00121 pound, at 102°, 0.003 pound, and so on.

"Is there any difference between steam and humidity?" Steam is water in a gaseous state. There is no difference between steam and the gaseous or uncondensed vapor of water in the atmosphere. When steam escapes from a pipe into an atmosphere colder than itself it condenses into fog, which is visible, but if the atmosphere is not saturated with moisture it will rapidly dry the fog, turning it again into invisible vapor. Humidity is the condition of the atmosphere as regards moisture. Relative humidity is the ratio or percentage that the moisture contained in the atmosphere bears to the maximum quantity it can contain at the same temperature. Thus if a cubic foot of air at 62° contains 0.00087 pound of water vapor, the air is "saturated" and the relative humidity is 100 per cent., but if the same quantity of moisture is contained in a cubic foot of air at 72° the relative humidity is only $0.00087 \div 0.00121$ or 72 per cent.

"The manuals of the heating and ventilating engineers tell us that with a good system of ventilation the opening of windows causes only danger; yet as a matter of fact, children in rooms so treated do not exhibit the distressing conditions," etc.

The "danger" from opening windows is not to the children in the room in which the windows are opened, but to the children in the adjoining rooms in which the windows are not opened. In the fan-blower or "plenum" system of ventilation the entrance and exit flues and dampers are so designed and adjusted as to cause each room to receive its due proportion of the total air supply. If a window is opened in one room (unless the wind is blowing towards the window) the resistance to the passage of air from the room will be less than if only the exit flue were open; consequently there will be a lower static pressure in this room than in the other rooms, and it will receive from the entrance flue more than its proper share, thus robbing one or more of the other rooms of their share. The flow of air in a complex system of piping is like the flow of water. If in an apartment house with ordinary plumbing a tenant on a lower floor draws hot water into a bath tub, he will rob the bath room on the floor above of its hot water supply for the time being. So in a school-house fitted with air pipes, if the flow of air from the fan into one room is increased by opening a window, there will be a smaller supply for the other rooms. The "danger" therefore is that of unbalancing the ventilating system. This danger would be avoided if there were in use an automatic ar-