Correspondence.

The Origin of Sweet Corn, and Early Use of the Tomato.

To the Editor of the Scientific American:

In your paper of February 16, in a note on origin of sweet corn, it is stated that sweet corn is not referred to by Jefferson in 1781, nor by Thorburn in 1817, nor by Fessenden in 1828. In 1832 it is mentioned by Bridgeman, and by Binot in 1851.

The writer found it in 1815 on the table of Rev. James Freeman, in Newton, Massachusetts, who raised it largely on his farm. The same skillful horticulturist was among the first to raise the tomato, I think about 1818, and I remember how few people could then be induced to taste a fruit now so popular.

S. C. CLARKE.

Marietta, Georgia.

Chimney Ventilation for Sewage Disposal Systems.

To the Editor of the Scientific American:

In reading Dr. Sloane's article, in your issue of February 23, upon "Process of Sewage Disposal," one or two facts occurred to me in illustration and justification of his theory. These facts I think will be seen to be of interest and importance in this connection.

Some years ago, under the escort of Mr. Harrison, then mayor of the city of Minneapolis, Minnesota, I made a visit of inspection to those public buildings and private residences which were warmed and *ventilated* by the "Ruttan patent."

This essentially consists of a central chimney, gauged, as regards its capacity, its height and dimensions, by the cubic area of the building to be warmed and ventilated. The smoke pipe of the furnace is carried up through the chimney, being fastened by clamps to one of the inside corners.

So great was the draught of these chimneys, that a silk handkerchief, released in the cellar opening, immediately ascended and was shot out from the top with great force.

With Mr. Harrison I went down, by a permanent iron ladder, to the very bottom of the lighted vault of a public school building. This vault was 12 feet square and 12 or 14 feet deep. It received the discharge from the different closets in the building. All fecal matter went into it. Yet so rapid was the evaporation caused by the great chimney which had its lower opening in this vault, that the residuum, after weeks of unremoved deposit, was a *dry inodorous powder*, upon which one could step as upon a dusty road.

Again, in the city of Laramie, Wyoming Ter., as I noticed on a more recent visit to that place, the refuse from the houses and stables is thrown into the alleys and seldom removed. Yet so rapid is the evaporation in that dry and breezy climate, that one can at all times walk through these alleys "dry shod."

Rapid evaporation is a notable peculiarity of a very dry climate. The same result would be reached by the operation of a large chimney, such as I have described. It would be an effectual desiccant for a sewer vault.

As Dr. Sloane says: "When the aqueous portions of sewage are disposed of, nine-tenths of the problem is solved."

This simple appliance of a heated chimney exhausting a sewer vault would, I think, be found sufficient and effectual for "small systems," for farm houses, for large hotels used as summer resorts, for localities where no drainage is possible, for buildings that are almost on a level with tide water.

GEO. W. DU BOIS.

Hartford, Conn.

Gravity at Different Heights.

At a recent meeting of the Berlin Physical Society, Dr. Thiessen gave an account of experiments which he had carried out in order to measure the amount by which gravity varies at different heights. The method he employed was that of Jolly, but with the introduction of a modification, in order to eliminate the irregularities due to differences of temperature at the higher and lower stations. Scale pans were attached to each arm of the balance—one close up to the beam, the other some distance below it—and the weight was interchanged between the pans, both at the upper and lower stations, thus eliminating the influence of differences of temperature and of any inequality of the balance. The upward force of the air had no influence on the results, notwithstanding the varying volumes of the weights used. The distance between the upper and lower scale pans was 11·5 meters, and the weight used was 1 kilogramme. Twenty-four determinations were made, which gave as a result that the kilogramme, when in the lower pan, weighed 2·8 milligrammes more than when it was weighed in the upper pan. After making some corrections, and, among these, one necessitated by the fact that the weight in its lower position was 4 meters below the general surface of the earth. it was found that the weight of 1 kilogramme varies by 0·28 milligramme for each 1 meter of difference in altitude.

The United States at the Paris Exhibition.

The United States will make a creditable display at the Paris Exhibition. And this is as it should be; for, although nominally a universal exposition, it will be practically a display of the products of republics. The monarchies of Europe will be represented only by private exhibits, while the republics of North and South America have rallied in force. The United States Department of Agriculture will make a splendid showing. Secretary Colman has placed the undertaking in the hands of Professor C. V. Riley, the famous entomologist, an energetic organizer as well as a careful and enterprising scientific observer; and Professor Riley has already sent forward three car loads of products, which are on the way to France in charge of Mr. F. T. Bickford, an assistant. The bulk of shipments are nearly through with, and the perishable staples will follow during the next month. Congress appropriated $250,000 to aid exhibitors, and Secretary Colman's quota of this will insure the best illustration that the agricultural resources of this country have ever had on the continent of Europe. Various branches will be represented, as follows: Fruit, Professor Van Deman and Professor George Hussman; grain, George N. Hill, St. Paul, Minn.; cotton and fibers, Col. James A. Benford, Duck Hill, Miss., and Charles R. Dodge, Boston; tobacco and peanuts, Alexander McDonald, Virginia; agricultural education and experimental stations, W. O. Atwater, Department of Agriculture; vegetables, including hops, M. G. Kern, St. Louis; entomology, including apiculture and silk culture, C. V. Riley, N. W. McLean, of Hinsdale, Ill., and Philip Walker, Department of Agriculture; sorghum and other sugar plants, H. W. Wiley, Department of Agriculture; forestry, B. Fernow, Department of Agriculture, and M. G. Kern, of St. Louis; grasses and forage plants, George Vasey, Department of Agriculture; meat products, Dr. De Salmon, Department of Agriculture. All articles for exhibition will be forwarded free from New York, and no charge will be made for space in Paris. Professor Riley has put forth unusual exertions to get the exhibit on the road, and he looks forward with much enthusiasm to the result. He will not leave for Paris till the first week in April.—*Science.*

Obscure Dangers of Drinking Water.*

The difficulty of detecting the typhoid germ is so great, owing to its form being like that of many other bacteria, and the number of typhoid germs is so small compared with the volume of water and with the multitude of other bacteria usually present, that the isolation and determination of the existence of this microbe in large bodies of water, by culture investigations and the microscope, has thus far proved practically impossible, on account of the many tests required before a cautious investigator would dare to pronounce large volumes of water free from pathogenic microbes.

Some of the worst forms of disease may be widespread through a community by means of the water supply, as was noticeably the case in Plymouth, Pa., and yet both chemical and biological analysis may fail to discern the particular matter which carries the deadly seeds of epidemic. One of the public water supplies of Plymouth contained a much greater amount of organic matter than the other, but it was the water chemically purest which carried disease and death.

With most waters that are proposed for public supplies, there being as yet no practicable means of saying definitely whether they do or not contain the germs of zymotic disease, all that can be determined with regard to them is, first, whether or not they are so situated with regard to sources of contamination that disease germs are likely to enter the waters, and, second, whether the waters exist under those conditions which are favorable to the multiplication of such pathogenic bacteria as may find their way into them. No waters are absolutely free from danger, but some are far more liable than others to be the carriers of disease.

A water supply commonly free from the specific germs of disease, but having conditions favorable to their development, may, when exposed to contamination, be suddenly invaded by pathogenic bacteria and an epidemic produced. When chemical analysis shows a water to contain excessive quantity of putrescible nitrogenous matter according to accepted chemical standards, such water is objectionable on the ground that this matter may afford the pabulum essential to bacterial development. In the presence of (local) putrefaction, spores are often found in great numbers, even when the general body of the water does not appear impure by chemical tests. For this reason, the occurrence in a stream, or body of still water, of limited localities, where quantities of organic matter accumulate and putrefy, may create hot beds for the propagation of bacteria, whose myriads of spores may be diffused through great volumes of water of high chemical purity, possibly contaminating the whole mass. The general body of water may not contain sufficient food or be of proper temperature itself to cause the development of the spores or seeds, but if there are pathogenic germs among them, they will develop when drunk by susceptible persons, and become active agents of disease.

*Report by Jas. T. Gardiner, in the *Sanitary Era*.

A Deep Artesian Well.

The deepest artesian well in the world is now claimed as supplying the baths at Pesth in Austria-Hungary. It is said to be 8,140 feet deep and supplies 176,000 gallons daily at a temperature of 158° Fah.

This temperature does not indicate that all the water comes from the full depth of the well; as the average assigned increase in temperature from observations in deep wells and mines has been found to be 1° Fah. for each 60 feet in depth below the plane of stationary temperature, which in the temperate zone is between 50 and 80 feet, the variation being probably due to variation in the annual mean surface temperature and the conductivity of the rocks beneath. The increase of 1° Fah. in 60 feet would indicate a temperature of 185° Fah. at a depth of 8,140 feet, while an increase of 1° in 54 feet, as found in some other deep borings, would indicate a temperature of 200° at the bottom of this well, thus showing in all probability that the flow of the well is made up of inflowing streams at various depths. The boring for hot water for heating purposes, as has been lately suggested, would be subject to the influx of mid-streams, which, if shut off by piping, would largely diminish the supply, and thus limit the scheme for tapping the subterranean heat of the earth.

The Corrosion of Steel Ships.

An alarming illustration of the facility with which steel corrodes under certain conditions, the *Engineer* says, has been just supplied at Portsmouth. H. M. S. Nile was launched at Pembroke on the 27th of March last, since which time, as there is no dock accommodation at the Welsh yard, she had been afloat in her launching trim without there being any opportunity afforded of examining and protecting the under-water parts of the hull. When she was placed in No. 13 dock at Portsmouth for the purpose of removing the launching gear and changing her temporary propellers, it was discovered that the red lead with which her bottom was coated had extensively peeled off, and that serious corrosion of the plating all along the water line on both sides had taken place. The starboard side amidships is very much pitted, though, as a rule, the pitting and scoring are tolerably uniform. The rivet heads are greatly corroded, and in many instances they appear to be completely eaten away.

Wyandot Cave and its Wonders.

By the invitation of the Long Island Historical Society, of Brooklyn, N. Y., a highly original and unique lecture was delivered in their hall last Tuesday evening by Rev. H. C. Hovey, D.D., of Bridgeport, Conn., concerning the marvelous and picturesque features of Wyandot Cave. The hall was crowded, and the audience expressed great pleasure at the entertainment given. Dr. Hovey was the first writer to bring the Indiana caverns into general notice, through the New York *Tribune*, the *Century Magazine*, and other periodicals, as well as by various papers read before scientific societies. A few years ago he took with him a skillful artist, who made a large number of sketches, some of which were afterward published. But during the last year a young artist, Mr. Ben Hains, has taken for Dr. Hovey's use a series of admirable photographs, which were exhibited for the first time in connection with this lecture. Besides the series from Wyandot Cave, there were some lovely scenes from Marengo and Sibert's Caves. These are pronounced the very best specimens of subterranean photography yet produced.

Prizes for Scientific Works.

The Royal Academy of Sciences of Turin, in accordance with the last will and testament of Dr. Cesare Alessandro Bressa, and in conformity with the programme published Dec. 7, 1876, announces that the term for competition for scientific works and discoveries made in the four previous years, 1885–88, to which only Italian authors and inventors were entitled, was closed on December 31, 1888. The Academy now gives notice that from January 1, 1889, the new term for competition for the seventh Bressa prize has begun, to which, according to the testator's will, scientific men and inventors of all nations will be admitted. A prize will, therefore, be given to the scientific author or inventor, whatever be his nationality, who, during the years 1889–90, "according to the judgment of the Royal Academy of Sciences of Turin, shall have made the most important and useful discovery or published the most valuable work on physical and experimental science, natural history, mathematics, chemistry, physiology, and pathology, as well as geology, history, geography, and statistics." The term will be closed at the end of December, 1890. The value of the prize amounts to 12,000 Italian lire ($2,500). The prize will in no case be given to any of the national members of the Academy of Turin, resident or non-resident.