IS GLUCOSE WHOLESOME?

With the increased production (and presumable consumption) of artificial grape sugar and glucose, this question is often asked, and as the data for its correct answer are few, the replies are not entirely satisfactory. No one ever suspected that natural grape sugar was not healthy, but it has been claimed that the artificial product contained sulphates and other salts, that it was made in leaden or copper vessels, and was contaminated with these metals.

These points are easily set at rest by a chemical analysis, but it must be repeated for each different brand. These substances have rarely, if ever, been detected, and opponents of the new sugar have sought to prove that it contained organic principles, not to be detected by analysis, which were harmful.

In the SCIENTIFIC AMERICAN of February 26, 1881, will be found the result of some experiments made by Dr. Nessler with the unfermentable constituents of grape sugar made from potato starch. As grape sugar is used to a considerable extent in Europe for improving poor wines according to Dr. Gall's process, of course this discovery made a sensation, which induced the German government to prohibit its use for this purpose. Several persons were fined under this law for selling "improved" wine, under the supposition that it would be dangerous to drink it.

Dr. Von Mering has since taken up the subject and repeated Nessler's experiments in a more rational manner. He found that the *dangerous* residue was merely a little dextrine, which instead of being unwholesome is really nutritious.

Previous to Nessler's experiments, Schmitz had published a dissertation (Cologne, 1878), in which he sought to show that this "improved" wine was unwholesome, because after drinking a bottle of such wine in the evening he felt sick at his stomach, and had a headache the next morning. These things sometimes take place when pure liquors are drunk! Schmitz also injected some of this unfermentable residue under the skin of a young dog and of a cat, but the quantity used was unreasonably great, as it bore the same relation to the weight of the animal as 6½ pounds sugar does to an ordinary sized man.

Nessler took such an amount as corresponded to 3⅛ ounces of sugar at 7 and at 10 A.M., and then felt unwell at noon.

Von Mering in his experiments took the residue from over 20 ounces of starch sugar within three days and yet felt no inconvenience or discomfort. He repeated the experiments in different ways, on other persons, and only in one case, that of a very nervous maiden of 18 years, who took the stuff much against her will, were any bad feelings experienced. The experimenter drank 3 liters of the condemned wine in 3 days, and felt none the worse for it.

Numerous experiments were likewise made on animals, both by hypodermic injections and by introduction into the stomach. Of course the injection of a considerable amount of fluid under the skin will make an animal restless and uneasy, but it was not found that solutions of the unfermentable residues of grape sugar produced any different effect from so much water. But this method of experimentation, so much relied on by Nessler, is not as convincing as administration by the mouth.

The question is of more interest here, from the fact that glucose is used by brewers, and the unfermented residues remain in the beer. It is, therefore, expected that these experiments will be repeated in this country with American glucose from corn. Glycerine is sometimes employed in sweetening wines, but it may also be impure.

CHEAP POSTAGE AT LAST, AND POSTAL NOTES IN ADDITION.

The late Congress passed a law which will be hailed with general satisfaction by the people, namely, the reduction of the rate of postage on letters to two cents. The United States may now be considered as standing at the head of the nations in the matter of cheap postal facilities. We are indebted to Mother England for teaching us the A B C of popular postal transmission; for a score of years her rate has been two cents. But no such costs, difficulties, and distances have had to be overcome in carrying the mails in Great Britain as in this country. Her postal routes are short, her total area being only about one hundred and twenty-two thousand square miles, while ours is not far from three and a half millions of square miles.

Many of our important towns are from one to four thousand miles apart by the postal routes, over which we have been long carrying letters for three cents. Under the new rates of two cents, the quantity of letters to be carried will doubtless be greatly augmented.

The new two cent rate goes into operation October 1. The post office authorities are engaged in preparing a brand new two cent stamp, with which to inaugurate the happy event.

Another accommodation for the public will also soon come into vogue, namely, the issue of postal notes for small sums. By payment at any post office a postal note for the amount is to be given, which will be payable on presentation at any other post office.

The post office authorities are making preparations as rapidly as possible for the issue of the new postal note. It is to be engraved with great care, the work upon it to be equal to that on the national banknotes, in order to protect the holder. It is expected that this note will prove of great benefit to all who desire to use the mails to purchase books, newspapers, and merchandise. The authorities admit that it is an experiment, and do not expect that the system will any more than pay expenses.

LONG DISTANCE TELEPHONING.

A notable experiment in long distance telephoning was recently made on the new compound steel-copper wire of the Postal Telegraph Company, lately completed between New York and Cleveland, Ohio, a stretch of 650 miles.

The compound wire has a diameter of $\frac{1}{8}$ of an inch, consists of a steel wire core, weighing 200 pounds per mile, that will resist a tensile strain of 1,650 pounds, on which copper is deposited to the extent of 500 pounds per mile, with a resistance to the electric current not exceeding $1\frac{7}{10}$ ohms. The wire has seven times greater conductivity than iron wire of equal size, copper being the best conductor known except silver. It has double the tensile strength of iron wire of equal weight when strung on the lines, will last longer, permits the use of low tension currents and small batteries.

Ninety per cent of the wires now in use are No. 9 iron, with a resistance of 20 ohms per mile, and the very best are No. 6 iron, with a resistance of 10 ohms, while the compound wire to be used by this company has a resistance of only $1\frac{7}{10}$ ohms. The resistance of No. 9 iron wire on a line from New York to Chicago, 1,000 miles, is over 20,000 ohms, and on a No. 6 iron wire over 10,000 ohms, and on the compound wire less than 1,700 ohms, thus bringing Chicago telegraphically as near to New York as Philadelphia, and San Francisco as near as Cleveland, compared with the best wires now in use.

When the two compound wires are completed between this city and Chicago, their operating capacities will, it is said, be thirty thousand messages per day.

The new conductor is certainly a great improvement over any land line of similar length heretofore established, and its successful completion marks the opening of a new era in the progress of electrical communication.

We learn from Mr. F. W. Cushing, the manager of the Postal Telegraph Co. in this city, that on the 7th inst. a speaking trial was made over the new line from New York to Cleveland, the transmitting telephone used being that of Mr. Geo. M. Hopkins. The words spoken in this city were, it is said, distinctly heard in Cleveland. The success of the experiment was so conclusive as to satisfy the officers of the company that in the near future the length of the telephonic circuits may be greatly extended; and they believe Chicago will shortly be brought within hearing of New York, a distance of about one thousand miles.

The peculiar feature of the Hopkins transmitter is that one end of the carbon electrode is supported upon or floats on a liquid—mercury—the fluid serving to press the electrode into contact with the carbon button of the telephone diaphragm, without the intervention of a spring or weight. It is, therefore, a self-adjusting instrument, always in readiness for speaking, whether subject to the loudest or the softest tones, upon the longest or the shortest lines. In our paper for May 8, 1880, we gave illustrations of this instrument; little expecting, at that time, it would ever be used to convey speech from New York to Cleveland.

We congratulate the Postal Telegraph Company upon the successful operation of this first link of their new wire. It is likely to revolutionize the telegraphic service of the world by leading the way to the substitution of easy, economical, and scientific lines and modes of working in place of the present systems, which, by comparison, are difficult, costly to operate, and unscientific.

Flying Foxes in Australia.

Once I visited a great "camp" of fruit eating bats, "flying foxes" as they are here called (*Pteropus poliocephalus*). In a dense piece of bush, consisting principally of young trees, the trees were hung all over with these bats, looking like great black fruits.

As we approached, the bats showed signs of uneasiness, and after the first shot were rather difficult to approach, moving on from before us and pitching in a fresh tree some way ahead.

The bats uttered a curious cackling cry when disturbed. They were in enormous numbers, and although thousands had been shot not long before by a large party got together for the purpose, their numbers were not perceptibly reduced. They do great harm to the fruit orchards about Paramatta, and the fruit growers there organize parties to shoot them. They have the cunning to choose a set of trees where the undergrowth is exceedingly dense, and where it is therefore difficult to get at them.

I shot seven or eight, but they are very apt to hang up by their hooked claws when shot, and I lost several. I could find no Nycteribia living on these bats, although these insects are usually so common on the various species of Pteropus.—*Prof. Mosely.*

Cheap Black Ink.

The *Industrie Blatter* recommends the following formula as furnishing a good and cheap writing ink:

French extract of Campeachy wood 100 parts, lime water 800 parts, phenol (carbolic acid) 3 parts, hydrochloric acid 25 parts, gum arabic 30 parts, red chromate of potash 3 parts.

The extract is first dissolved in the lime water on a steam bath with frequent stirring or shaking, after which the carbolic and hydrochloric acids are added, and change the red color to a brownish yellow. It is then heated half an hour on steam bath and set aside to cool. It is next filtered, and the gum and bichromate, dissolved in water, are added. Enough water is then added to make up the solution to 1,800 parts. This ink is a fine red when used, but soon gets black.

CURIOSITIES OF THE RAILWAY CENSUS.

In our number for March 3, under the above heading, was a paragraph relating to the difference between the receipts of railways for transportation of passengers and freights, in which the results were rendered rather absurd by the use of mighty dollar marks instead of humble cents. The paragraph should read as follows:

The freight carried in 1880 was two hundred and ninety-one millions of tons, for which the railways charged 1·29 cents per ton per mile, and made a profit of 0·53 of a cent per ton per mile.

The number of passengers carried was two hundred and seventy millions, for which they each paid an average of 2·33 cents per mile, and the companies made a profit of 0·62 of a cent per mile. If the passengers are counted by weight, allowing 14 passengers to the ton, then the receipts of the companies for their two legged freight was $32.26 per ton per mile, and their profit was 86·8 cents per ton per mile.

By the ton, then, passengers yield sixteen times more profit to the railways than ordinary freight.

We renew the suggestion that there seems to be an opportunity here for the exercise of genius by railway managers in the development of new and better inducements for travel. Various suggestions, doubtless, will rise in the minds of readers, such as the adoption of improved means for safety, smoothing and better ballasting of roadbeds, faster time, easier and more commodious cars. But without going through the entire list of improvements that might help travel, we will name one subject that railway officials might study and proceed to carry out at little expense, as a help to passenger traffic, namely, the inauguration in every city, town, and village of a thoroughly good and cheap service for the use of customers between their homes and the stations. At present the companies leave their patrons to the tender mercies of extortionate hackmen and baggage smashers; and so general are the inconveniences that exist between residence and car that probably not a hundred tickets are bought where a thousand would be purchased if a first-rate service, such as we have indicated, could be realized.

The Great Floods of 1883.

The present year will be memorable as the witness of some of the most remarkable floods of modern times. For weeks past the principal river regions both of Europe and the United States have been the scenes of unparalleled disasters. Several large cities, many towns, and hundreds of villages have been inundated, cattle, buildings, and products, the accumulations of years of industrious toil, have been swept away, many lives lost, thousands of people rendered homeless and reduced to poverty. Financially the losses are to be measured by millions of dollars.

In this country the valleys of the Ohio and Mississippi Rivers, with many of their tributaries, have been converted into vast inland lakes; the ancient time, when the Father of Waters, from the Gulf of Mexico to the mouth of the Ohio, had an average width of fifty miles, seems almost to have returned.

We might fill many columns with the details of extraordinary occurrences pertaining to the present floods; but the following, as a general example, must suffice: "Memphis, Tenn., March 7, 1883: The nearest point of land to Tiptonville, Tenn., is ten miles distant. The town is in the midst of a great lake. Two-thirds of the county in which it is situated are deeply flooded, and nearly every farmer in the overflowed districts has lost his corn, hogs, and cotton. Fences have been swept away as well as outhouses and many dwellings. Hardly a farmhouse has been left along Reelfoot Lake, which is now rushing like a torrent through Obion and Deer Rivers and into the Mississippi.

Alexander H. Stephens.

One of the prominent historical characters of the great South has passed to his final rest, after many years of active industry maintained in the face of personal sufferings that would have compelled ordinary people to keep to their beds. Alexander H. Stephens was born in Georgia, February 11, 1812. He graduated at the head of his class at the University of Georgia in 1832. Although poor health was his inseparable companion, he achieved fame as a young lawyer. In 1836 he began public life in the State Legislature. In 1843 he was elected to Congress; and was almost a continuous Representative from that year to 1882, except during the period of the rebellion. Last year he was chosen Governor of Georgia, and died in the harness, at Atlanta, on the 3d of March. The physicians say that his death resulted from overwork of the brain—his duties having been heavy and his attention to them unabated.

His personal appearance was remarkable. His weight was about ninety pounds, and in these later years he always occupied a wheeled chair, being unable to walk. His voice was like that of a child. He was the author of a "Constitutional View of the War," of which 100,000 copies were sold, and also of a "History of the United States," just issued.

Important Tax Reductions.

The Congress which has just adjourned made several important changes in the revenue law, by which taxes are reduced and some inconveniences of doing business are removed. For example: On and after July 1, 1883, the stamp tax ceases on bank checks, drafts, orders, vouchers, and the tax on matches, medicines, perfumes, etc. The taxes on tobacco and dealings therein are also greatly reduced.