

verse as conveniently as if both were directly connected with one office.

The subscribers' wires are united into cables of fourteen wires each. They are affixed to the vault of the sewer and are consequently out of sight and out of the way.

The telephone company extends the double telephone wires from the subscriber's instrument through a hole in the sewer, and connection with the proper wires and cable is made by the agents of the administration of the telegraph.

The ends of the wires of the cables are distributed over the switch boards in the wire cellar of the central office, and upon one of these switch boards the double wire of the subscriber terminates and is readily found.

The telephone used in Paris is Adir's. Three cells of Leclanché battery are employed, one for the transmitter and two for calling. Every three months the transmitters are changed, and although they might be able to work longer, this plan is adopted to insure good service.

The Pittsburg Exposition.

The seventh annual exhibition of the Pittsburg Exposition Society will be held in the city of Allegheny, opening September 6, and closing October 13, 1883. The main building is 600 feet long by 150 feet wide, with galleries 45 feet wide, extending around the entire building.

A Fatal Earthquake.

The recent accounts of the destruction in the island of Ischia, opposite Naples, revives the old time records of the ravages of the earthquake in Portugal and other countries. A sudden shock of earthquake was felt at a little after nine o'clock, July 28, in Casamicciola, Ischia, at which hour a large portion of the people were at the theater.

The ground opened in many places, while in other places there was no movement. Water gushed out of springs. Several boilers in the bathing house burst. The theater, which is a wooden structure, was literally torn open, allowing the audience to escape.

The Brush Secondary Battery.

The patent interference case of the American Electric Storage Company of New York against Charles F. Brush of the Brush Electric Company of Cleveland, Ohio, was decided Aug. 2 by giving Brush priority of invention. The declaration in the case contained three counts, each supposed to represent a distinct invention claimed by both parties.

Two Disagreements Ended.

A strike by about 900 cloakmakers in New York city was ended August 2, after an idleness of two weeks. The terms of the agreement finally made were a guarantee of \$15 per week to each salaried employe on the basis of eleven hours per day.

On the same day the lockout of 10,000 cigarmakers was ended by mutual concessions by the strikers and the manufacturers' union, the actual terms not having been made public. This lockout lasted sixteen days.

A FRUITFUL source of damage done to boilers, and one which has ruined thousands, is the practice of blowing a boiler off and immediately refilling it with cold water, while the brickwork is red hot. The Age of Steel believes that nothing will tear a boiler to pieces quicker than this.

Scientific American.

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NEW YORK, SATURDAY, AUGUST 11, 1883.

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THE REVIVAL OF CHERRY.

Those to whom fifty years is a memory readily recall the cherrywood tables, bureaus, drawer chests, that were then in fashion, when the more gaudy and more costly mahogany had but lately come in. It is an evidence of a return to good taste that the wood of the cherry tree is again in favor, not only as it exists in old furniture, but in its new requirements. It is largely used in cases for musical instruments—melodeons and organs—and in furniture—chairs and tables—after being "ebonized," or blackened by acids and dyes. But it is also coming again into use in its natural color. One of the finest banking houses in the Eastern States is finished entirely in cherry, and it is beautiful. The wood, filled and not varnished, has a soft glow not possessed by any other, and has none of those distortions of grain that are so unpleasant in mahogany.

The timber is chosen from the wild cherry, which in New England and the North generally does not usually grow to a girth of more than twenty inches, but in some of the Western States and in the South frequently attains a diameter of twenty-four inches. The domestic fruit cherry gives some good specimens of small timber, but as the tree is rarely sacrificed until it is past bearing and is decayed, this source of supply is precarious. Like all close grained timber, the best specimens are those which grow singly in exposed situations and not in a dense forest. The facility with which cherry can be worked makes it a favorite with the cabinet maker.

EFFECT OF ALCOHOL UPON DIGESTION.

It cannot be claimed that we have yet learned all that is to be known about our stomachs and the reactions that take place within them, notwithstanding the fact that one man, at least, lived for many years with an open window, as it were, in his stomach.

Every contribution to our knowledge of the subject based on real, first hand, experimental proof, has some value, hence we think that the recent experiments of Dr. P. J. Spenser upon the effect of wine on the medical properties of pepsine are worthy of careful and thoughtful attention, imperfect as they are.

Pepsin, also known as chimosin, is one of the active ferments of digestion. For medicinal purposes it is prepared by scraping the well washed stomach of a hog, and in this state possesses the property of dissolving a large quantity of coagulated albumen, such as the white of egg. Dr. Spenser, in his paper read before the Ohio State Pharmaceutical Association, gives the amount of white of egg (hard boiled) that will be dissolved by one grain of the pure pepsine, of different makers, when mixed with eight drops of pure concentrated hydrochloric acid in six hours. The amounts varied from 68 to 170 grains, with an average of about 80 grains.

He found that the acid alone would dissolve half as much as the acid and pepsin, or 40 grains, and that eight drops of acid and 100 c. c. of ten per cent alcohol would dissolve as much albumen as the ordinary commercial pepsine and acid would together. This would make alcohol equal to pepsine as a digestive agent for egg albumen. For raw beef the case is quite different; acid and alcohol having less power than acid alone, while acid and milk sugar dissolved as much meat as the best pepsine with acid.

It is to be regretted that alcohol was not tried in combination with pepsine.

In conclusion, Dr. Spenser states his conviction that an hour's exercise in the fresh air is equal in digestive power to any usual dose of pepsine, regardless of maker. When commercial pepsine is used it should be as fresh as possible.

H. Seeman has proved (Centralblatt fur Med. Wissensch.), that free hydrochloric exists in the stomach, although the presence of peptones prevents its detection by means of methyl violet. This is probably one reason why it has so long been an unsettled question whether it was hydrochloric or lactic acid that gave the acidity to the gastric juice.

AERIAL NAVIGATION.

A certificate of incorporation has been filed in the office of the Secretary of State of Illinois for the "Aerial Navigation Company of Chicago," the object of the incorporators being "the transportation of passengers and freight through the air." It is asserted that the machines to be manufactured by this company are a perfection of the one tested at Hartford, Conn., several years ago, which at the time attracted considerable interest. Probably this refers to several trials of a balloon made by Mr. E. F. Ritchel, of Bridgeport, Conn., who exhibited in Hartford, in June, 1878, a balloon with propelling apparatus attached by which the upward and downward movements of the balloon could be governed, and by which in calm weather its course could be directed.

The balloon was a horizontal cylinder of silk, twelve feet long and twenty-four inches diameter, capable of containing about 3,000 feet of gas. Suspended to it by cords and steel rods was a flat frame of brass pipe, pointed at each end, and having a seat for the operator. In front of the seat was a gear wheel with two cranks, connected by a vertical shaft and a horizontal shaft to two propeller wheels, one at the lower end of the vertical shaft under the frame, and the other in front of the operator, and this wheel was attached to the shaft by a universal joint so that it could be turned a distance of about thirty degrees from the shaft in a horizontal plane by the feet of the aeronaut. This wheel was the propelling power and also the steering device. The levitat-

ing power of the balloon was barely sufficient to raise the apparatus and its load, the vertical propeller assisting if a rapid rise was desired, and bringing the balloon down without emitting any of the gas.

At one trial, on a calm day, the balloon rose from the baseball grounds at Colt's Meadows, Hartford, passed over Colt's factory, and nearly over the Connecticut River, turned about and returned, descending to the ground at the place from which it started, the distance being probably half a mile and return, the balloon's height after rising from the earth varying from 300 to 400 feet, or thereabout.

At another trial, on the succeeding day, with quite a stiff breeze blowing, the aeronaut was unable to turn his balloon around, or to stem the wind, and was forced a distance of nearly nine miles, when he descended and came back, with his balloon, by carriage. But on this occasion he descended once on his trip to the dooryard of a farmer, procured a glass of water from the well, and rose again, hoping to make a return trip.

No accurate test was ever made of the propelling or lifting power of the two fans, but they were sufficient, as proved by repeated experiments, to raise, lower, and steer the balloon except in a strong wind, the operator rotating the cranks at the rate of 100 revolutions per minute, producing, by means of pinions, a revolution of the fans of 3,500 turns per minute.

CHOLERA.

The article quoted from the *Lancet*, July 28, says: "We know that it (cholera) is propagated solely through excreta; obviously, if the excreta of a cholera patient are allowed to dry in contact with the air, the air will then become infected. . . . It is wanton recklessness to let excreta pass into the sewers. . . . Whatsoever disinfectant we employ, we should use at once."

The writer of the above was certainly not aware that our sanitary plumbing laws do not allow the excreta to pass into the sewer without going through a long soil pipe in the house, where, before it enters the sewer, it encounters a current of fresh air which there is made to enter the pipe, and traveling in the opposite direction through the whole length of the pipe to the top of the house after having, according to its nature, as is above stated to be well known, taken the infection from the excreta, and then passes out through the open end at the top of the house.

On a calm day, when the atmosphere is called heavy, the air from thousands of excreta pipes doubtless does sometimes make its presence known to the dwellers and walkers below, whose supply of air comes from above, but perhaps it was considered that the noxious quality of the infection would be lessened by the greatness of the number of people who would share it between them.

On such days in London, when the foggy air enters the city at one end, there you may see a long distance; but as it slowly travels along its miles of streets, it gains gradually in density by the smoke from the tops of the houses growing darker and darker, until before it has reached the other end the continuously added contributions have made it dark as night.

If infection add to the specific gravity of air, would it not act in New York as coal smoke does in London?

A plausible plan would be to make it impossible for sewer gas to enter houses or otherwise do harm by causing draught from the houses to the sewer, and from the sewers through purifying fires and pipes heated by them, up high chimneys built for that purpose or those of manufacturers, who might be compensated for their use.

There may be some objection to that plan, but fifty years ago the largest hotel in Boston used it very successfully; a tall chimney in their courtyard, into which a draught was caused by a fire flue running into it, being made available.

CHINA AS A MARKET.

AN article in the *London Journal of the Society of Arts* for July gives some interesting statements in regard to China as a market for the manufactured goods of the Western countries. He says that the great and increasing demand for cotton goods has suggested to prominent Chinese the establishment of cotton mills to manufacture not only imported cotton, but that of native growth. The scheme has not, however, advanced much beyond the embryo stage. The writer says that there is a great demand in China for needles, matches, window glass, and kerosene oil. The oiled paper and semi-transparent shell that has heretofore been the substitute for glass in windows is gradually disappearing in localities near the trading ports.

As an instance of the increasing demand for glass, the following figures are worth noting. At the newly opened port of Wu-hu, on the Yang-tse-Kiang, the importations increased from 9,000 square feet in 1877 to 47,000 square feet in 1880. Again, at Wenchow, the importations for the same period increased from 7,400 square feet to 28,200 square feet.

The trade in friction matches is a large one and is increasing. At Hankow the importation increased from 42,980 gross in 1877 to 324,317 gross in 1880, while at Tientsin the figures were nearly doubled in one year, rising from 92,000 gross in 1880 to 181,540 in 1881.

Needles for hand sewing are largely imported, the English needles being deemed greatly superior to those made in China.

Brass buttons, fancy soaps, furniture, cutlery, clocks, toys, photographs, canned fruits, sweetmeats, and crackers and biscuit are all welcomed in China, and command good prices. Old iron is a commodity greatly in demand. Bale hoops from baled packages, barrel hoops, plates of boiler iron, wheel tires, old horse shoes, pieces of wire, and similar waste are in demand for small manufactures of iron and for strengthening manufactures of wood. The Chinese workmen prefer these scraps of iron to the mercantile sizes and shapes.

But the article of foreign commerce which threatens to distance all other competitors in point of popularity is kerosene oil. The development of the trade in this article has been remarkable of late. It is entirely supplanting the native bean and tea oil, which has done duty hitherto for lighting purposes, and may be truly described as supplying a want long felt. The oil is at present almost entirely supplied from the factories at Philadelphia, and the trade is practically a monopoly. From the high popularity it enjoys, there is every reason to suppose that, until the petroleum wells, which are known to exist in China, are opened up, the importation of the foreign article will continue to increase for many years to come. The extent of this increase may be gathered from the following returns: At Hankow, the imports rose from 27,976 gallons in 1877 to 285,157 gallons in 1880; at Wu-hu, from 2,199 gallons to 71,110 gallons during the same period; while the returns for Shanghai show that, in 1879, the importation reached the prodigious total of 4,780,440 gallons.

Stewed Fruit for the Gouty and the Dyspeptic.*

Probably the impression first created by scanning the title of this paper will be as follows: "Why, what have either the gouty or the dyspeptic to do with stewed fruit at all?" That sugar is apt to disagree with sundry stomachs, causing great acidity, is a clinical fact not to be disputed. But because such is the case with a limited number of persons it does not seem, to me at least, that therefore a sweeping prohibitory law is to be laid down for a large section of the community. Gout poison, all admit, is a product derived from the albuminous constituents of our food, as nitrogen is a marked element in its composition. It is, then, the albuminous element in our food which has to be avoided in lithiasis. How sugar, fruits, and even vegetables came to be banned, my researches have not enabled me to ascertain.

From the time of Magendie's path-breaking essay, writers on gout have advised the restriction of the nitrogenized, or azotized, constituents of our food in cases of lithiasis. But that the objection to sugar in gouty cases exists may not be denied. In speaking of stewed fruit for the gouty and the dyspeptic my views will be heterodox in the eyes of many. ~~One neither the rights of chemistry nor the lessons of practice~~ conflict with my views. I am quite prepared to undergo any criticism these views may elicit or provoke. Indeed, the subject would be all the better for being thoroughly ventilated.

At the outset, I admit that for many persons—gouty, dyspeptic, and glycosuric—ordinary stewed fruit is objectionable from the amount of added sugar it contains. Where the acidity of fruit is masked or hidden by an excess of sugar, then the resultant product is cloying to many palates, and offensive to many stomachs. Probably in this all readers will agree with me. But it is by no means necessary to render stewed fruit objectionable by adding much sugar to it. Deprived of this excess of added sugar, stewed fruit can not only be rendered unobjectionable, but be converted into an actual prophylactic measure, especially in cases of lithiasis. In order to attain this end all that need be done is to neutralize the excessive acidity by an alkali, and then little or no sugar is required. Thrifty housewives have long been familiar with the fact that the addition of a small quantity of the bicarbonate of soda to stewed fruit reduced the acidity, so as to save the necessity for much sugar. This was done simply for economy. The principle has a far wider application. Last June I was requested to visit a lunatic in the Midlands who was also gouty; and when the gout was acutely present she was more excitable and violent than usual. No medicine would she take, but she was very fond of stewed fruit. To add potash to her stewed fruit was very easy, yet very effectual. After this I gave my cook instructions to perform a series of experiments for me with all our ordinary native fruits. The result of this was that the amount of bicarbonate of potash required for each pound of fruit was found to be about as much as would lie upon a shilling. And this is a much better guide for a cook than to put so many grains.

With all fairly ripe fruit this was just sufficient to neutralize the acidity, and bring out the natural sweetness; indeed, the resultant product was quite sweet enough for most adult palates. Such stewed fruit could be eaten alone, or with milk puddings, or with cream, or the Swiss milk in bottles. Gooseberries, currants of all kinds, apples, and plums, all alike were excellent when so prepared. There are some points, however, to be attended to in practice, which are of more or less importance. The first matter is this: with dark fruits, as the black plum, for instance, the color is impaired by the alkali, and the fruit is less attractive to the eye than is that of the ordinary stewed fruit, which is of a deep, clear crimson.

This matter is easily got over: a little cochineal will give

* By J. Milner Fothergill, M.D., physician to the City of London Hospital for Diseases of the Chest. Communicated to the *Lancet*.

the desired color. Another is this: Where there is no natural sweetness, to neutralize the acid completely by an alkali leaves nothing, simply a cold mass, to which the palate is absolutely indifferent. Such is the case with rhubarb. Here it is well to use half or all the amount of alkali with some sugar. The same is the case with early gooseberries before they have any natural sweetness; no sugar formed in them. Here the full quantity of alkali should be used, and the remaining acidity met by sugar. Where three quarters of a pound of sugar is required to sweeten one pound of fruit, only one-quarter of a pound of sugar is necessary after the alkali has been added. The sour-sweet taste is thus secured, which is toothsome.

Now, in these two instances the stewed fruit is only rendered less objectionable to the stomach plagued with acidity, not made quite inoffensive. But for ordinary gouty individuals not troubled with acidity of the stomach, such stewed fruit is quite admissible, and forms a pleasant method of taking potash. The whole subject is one which deserves attention from invalids as well as their medical attendants, as it opens up to many a new field of diet altogether. Fruits *au naturel*—as the strawberry, for instance—are good in gout from the salts they contain, and are unobjectionable stewed, if it were not for the acetous fermentation of the added sugar. Here soda may be used. But where there is lithiasis the alkali ought to be potash. The gouty and the bilious alike are troubled with the products of the metamorphosis of albuminoids.

Neither the lithates of the gouty nor the bile acids of the bilious are derived from the saccharine or farinaceous elements of the food. It was possible to make bricks without straw, but it is impossible to make bricks without clay! No liver can make these nitrogenized substances from simple hydrocarbons: it is physically impossible! The dietary for each is the same—a non-nitrogenized dietary, in which vegetables and farinaceous matters are indicated, and saccharine matters, too, unless acidity in the stomach is produced by them. Milk puddings and stewed fruit are excellent for the dyspeptic, the bilious, and the gouty, as my experience tells me; and for one of those who suffers from taking sugar nineteen would be all the better for stewed fruit. But for those who dislike sweets, and for those who suffer from acidity, it is well to prepare the stewed fruit with alkalies, completely and solely or partially, as the case may be. This may sound very heterodox to some readers, but just let the incredulous test the matter for themselves.

Now, there are two other matters remaining to be alluded to, on which it is impossible to speak dogmatically or *ex cathedra*; they are, rather, matters of personal belief, and they are these: 1. It does not seem a matter of indifference in lithiasis what forms of albuminoids are taken. The flesh of animals is rather converted into peptones by pepsin in an acid medium—that is, by gastric digestion—than by trypsin in an alkaline medium. And such peptones seem specially liable to form lithates. Caseine is more specially digested by trypsin in the intestine, and such caseine peptones seem less readily converted into lithates; the clinical fact being that a milk dietary or a pulse dietary is good for the subjects of lithiasis. Caseine is the form of albuminoid, it seems to me, best suited to the gouty. Milk or milk puddings (made without eggs) are capital food for the cholæmic or the lithæmic. These fibrin-albuminoids, digested by pepsin, are laxative, while caseine is binding or constipating.

Milk puddings, then, go well with stewed fruit, which is a laxative. Many thoughtful physicians agree with me in the above matter. Now I am approaching what some may hold very disputable ground, yet nevertheless I venture to say here what I am beginning to think. Both for the classical diabetic and the glycosuric, cane sugar—the sugar of commerce—is bad, producing the unpleasant symptoms of sugar in the blood very readily. Yet many glycosuric individuals can take farinaceous matter with comparative immunity from discomfort. Starch in its way to grape sugar is much less troublesome than is cane sugar passing into grape sugar; why I do not know, but the fact remains. Now, with many glycosuric individuals fruit stewed in the manner advocated here is quite permissible, while ordinary stewed fruit is very objectionable.

For the dyspeptic, the gouty, the bilious, and the glycosuric individual (as well as the truly rheumatic, a small class), fruit stewed with an alkali in the proportion of as much bicarbonate of soda as will lie upon a shilling to the pound of fruit when put in the oven, will be found both palatable and permissible. It saves the gastric acidity from the acetous fermentation of the sugar in the dyspeptic, or with the glycosuric relieves him from the excess of cane sugar which disagrees with him. Where there is distinct gout, not only is fruit stewed with an alkali good and unobjectionable, but if it be prepared with the bicarbonate of potash it is converted into a therapeutic agent of no mean value; while the resultant product is quite sweet enough for a palate which has outlived the "sweet tooth" period. The whole matter is a simple one, yet it seems to contain much promise for many persons.

Progress of the Westinghouse Brake.

The reliability and excellence of this brake has become so well established by use on passenger cars that it is now being extensively applied to freight cars. We are informed that the Westinghouse Company now has orders to fit up sixty thousand freight cars with the brake.