4 feet, with a pressure of about 20,000 pounds, making a compact mass of rags that can hardly be pulled apart. A piece of heavy red sheathing paper and bagging is first laid on the bottom of the press before the rags are thrown in, and another piece across the top when filled. These are bound tightly around the rags with steel wire when the bale is formed, the attendants then rolling it out of the press to other operators, who even the ends with the same material, The bagging is then sewed up around the bales, which are then ready to ship to the shoddy clothing manufacturers. Forty-two bales can be pressed daily, the operation taking about 15 minutes for each bale. The sketches were taken from the plant of the Jersey City Wool Company, N. J.

Excavations at Corinth.

The work of excavation at Corinth has now been going on for over two months and will cease for this year after ten days more of excavation.

The work this year was necessarily of a tentative character, and was limited to the digging of trial trenches. We started in absolute ignorance of the topography of Corinth, the one monument of the city that was above ground—the ruin of one of the oldest temples in Greece—having been hitherto without a name.

The area within the city wall, which is still well preserved in a part of its extent, is very large, measuring about two miles from east to west. Where within this area lay the agora, around which most of the temples and other important buildings were grouped, was a question to which archæologists gave different answers. If some point of the agora or some building, particularly the theater, could be found, then we would know that we were on the track of Pausanias, who describes the city with considerable fullness. With this hope we dug twenty trenches, some with cross and side trenches. Most of them are fifteen feet deep, and some more than twenty, going down in every case to the original surface.

In the last week we have come to a result which deserves to be communicated to the American public. We have achieved success in the very form in which we would have preferred to have it come. We have found the theater! This is to us just now more important even than a masterpiece of sculpture, because it marks the end of the trial stage of our excavations, and makes a natural close of our first campaign at the same time that it crowns it with success.

If one takes down his Pausanias he will see that one temple is above the theater and another adjacent to it, with other important buildings near by. It is now clear that what must be done is to lay bare an area including the theater itself and all its neighborhood. The day of trial trenches being passed, the earth must no longer be carried out of deep trenches in baskets, but a narrow gage railroad, with dumping cars, must be employed to carry off the earth in quantity to some little distance, as was done at Troy and as is being done at Delphi. Land also must be purchased, either by us directly or by the Greek government for us.

Both these things will make a demand upon those in America who are interested in such an enterprise.

It is fortunate that nowhere near the theater is a single house. What is to be purchased is simply land, and, fortunately again, quite poor land, and a considerable area can be bought for $1,000. It would be better, however, to have a larger area. It would be well for some public spirited American to make the American School of Classical Studies at Athens a land owner in old Corinth, for in that case the finds of the excavators, according to a law which is now under discussion and likely to be passed, would go to American museums.

It is not at all strange that in the kind of work which we have done hitherto no conspicuous finds have been made. The misses of the trial trenches at Olympia and on the Athenian Acropolis were more conspicuous than their hits. It was only when large areas were laid bare that the soil yielded up its treasures. So, doubtless, it will be at Corinth.

Not that our work has not yielded objects of minor value. Several pieces of sculpture, the best of which is a group composed of a youthful Dionysos, accompanied by Pan and a nymph; a quantity of very old and interesting bases, which any museum would be glad to have; a considerable quantity of most interesting vase fragments of old Corinthian style; many archaic terra cotta figurines; and several Roman inscriptions—these make up quite an important result.

But, after all, it is the finding of the theater that enables us to appeal to the American public to support this work generously. In the excavation of a great city like Corinth, the first object must be the recovery of the buildings. We were glad to find a grave with interesting prehistoric bases, but this was something thrown in—an accidental discovery. The archaic terra cottas which are now coming to light (one might say in a mass) above the theater are to us most important, as indicating the proximity of some ancient temple, in which they probably served as anathemata.

For months we have been at the heart of this most interesting ancient city of Corinth in various spots, but at such a depth that even when we seemed near important things we were not able to proceed to the right or to the left. In one of our deepest trenches we seem to have struck the agora itself; but certainty will have to be deferred to another year.

The year, then, ends with a result which is an earnest of greater results to come, and which establishes a claim on the generosity of our friends in America, on whom all depends.—Rufus B. Richardson, in the N. Y. Times.

A PNEUMATIC INKSTAND.

The very convenient form of inkstand shown in the accompanying engraving has been patented by Mr. Rollo M. Badger, of Sayre, Pa. The device consists essentially of two separate parts: a base formed of glass, porcelain, or any preferred material, and an inverted reservoir, which is preferably formed of glass, and is provided at its lower end with a circular neck, which is perforated with three or more holes distributed evenly around the periphery and arranged at different heights above the lower edge of the said neck of the reservoir.

The base of the inkstand, which is circular in shape, is provided with an ink well, as shown, which communicates with an annular groove in the base. The inner wall of said groove is formed by a plug or stopper which fits the circular neck of the reservoir, the neck fitting snugly but loosely over said stopper, and being adapted to turn about the same. A vertical groove or slot is formed on the wall of the stopper, as shown, and extends from the top to the bottom. When the reservoir is turned so that either of the openings in the neck coincides with the vertical passage above mentioned, the ink will flow from the reservoir down said passage, and escape through said opening into the ink well, until the level of the ink in the well rises high enough to close the opening. The holes in the neck being located at different levels, it is evident that the amount of ink in the well may be regulated by placing the desired hole opposite the vertical groove. When not required for use, the ink in the reservoir may be shut off from the outside air by turning the reservoir so that the vertical groove will be completely closed.

BADGER'S PNEUMATIC INKSTAND.

The Cost of War.

The Christian Work gives the following figures regarding the cost of war and the casualties caused by it:

In the last two hundred years France has spent £993,000,000 in war. Even Belgium spends every year 46,000,000 francs on her army. In less than three hundred years Great Britain alone has spent £1,357,000,000 in war. At Bannockburn 135,000 men fought, and 38,000 were killed or wounded. Italy spends every year 14,000,000 lire (£560,000) on her army and navy. The French army costs every year 675,000,000 francs; the navy, 209,000,000. The peace footing in the Russian army calls for the services of 170,000 horses. The army of Bolivia costs the people of that impoverished country £360,000 a year. At Gravelotte 320,000 men were engaged, of whom 48,000 were killed or wounded.

In a late number of Comptes Rendus is a report of M. Flammarion that, in the month of April, three new divisions in Saturn's ring had been observed between the Cassini division and the Crape ring, thus separating the inner bright ring into four zones. One of the dividing lines was more conspicuous than the other two, which were observed with difficulty, because of faintness. Such divisions have been observed before, and some of them, if not all, are due probably to the attraction of the planet's satellites. M. Flammarion concludes that the fainter divisions are variable and due to the cause just named.

Science Notes.

The Zopherus melicanus is the only known species of the American beetle that has strength enough in its mandibles to cut metal—a fact that was accidentally discovered by F. W. Devoe, says the Medical Age. Some specimens of this insect were sent him from Brazil, and being busily engaged at the moment of their arrival, he simply provided them temporary quarters in a glass jar with a pewter top. Within less than forty-eight hours they had cut holes in the metal sufficient to protrude their heads, and would soon have escaped had not their operations been detected.

In connection with its work on clouds, the Weather Bureau has issued a sheet giving illustrations of the typical cloud forms. The accompanying text contains descriptions of the clouds, and also data as to their mean heights and velocities. The sheet was prepared as an aid to observers in their cloud work. Most of the types selected are good, and the reproductions excellent as a whole. The altostratus and stratus are, however, unsatisfactory. The International Cloud Atlas, which has just been issued, gives us the cloud types selected by the International Cloud Committee, and these will, of course, now be the standard for the world.—Science.

E. A. De Schweinitz and M. Dorset find that the amount of crude fat in tubercle bacilli (see Ph. J. [4], 1, 179) is about 37 per cent of the weight of the dried germs. The fat, about 3·5 gm. of which was extracted from the microbes, yielded a hard soap on saponification with sodium hydroxide, and proved to be principally a glyceride of palmitic acid. In addition, it contains a minute amount of the glyceride of a volatile fatty acid, to which tuberculosis cultures owe their characteristic odor, and very small amounts of lauric acid (?) and an acid with an unusually high melting point, having apparently a larger carbon content than any acid previously noted in plants (Jour. Am. Chem. Soc., xviii, 449).

Dr. Ferdinand Ranwez has made use of the X rays to detect mineral substances added to saffron as adulterants. Out of four specimens so examined, only one was found to be pure; another contained 62·13 per cent of barium sulphate, and a third 11·75 per cent of that compound, together with a certain proportion of potassium nitrate. The fourth specimen contained 50 per cent of pure saffron, and the rest consisted of some substitute for that drug, faced with barium sulphate to the extent of 28·6 per cent. The plan adopted was to wrap a gelatino-bromide plate in black paper, place the saffron upon this on the same side as the sensitive film, then allow the rays to act for four minutes, afterward developing and fixing in the usual manner. The foreign matter is very sharply indicated in the print illustrating the paper, which appears in the Annales de Pharmacie for May.

An interesting case of mimicry in plants is described in the Botanical Gazette, that of the seeds of the "Philippine Island bean" from the coast near Manila, which so closely resemble the quartz pebbles among which they fall, in shape, size, color, luster, hardness and stratification, as to be indistinguishable from them except by a very close examination. The size and shape of the beans are both very variable, ranging from four to nine tenths of an inch in length; some perfectly resemble well rounded beach pebbles, while others mimic pebbles which have been broken across. Their color varies from moderately dark to light drab, some giving a faint greenish tinge; others resemble pebbles of chalcedony or of crystallized quartz. Nearly all the specimens show a series of approximately parallel darker lines passing round, very suggestive of stratification. All are quite hard, cut only with difficulty with a knife, and give a clinking sound when shaken together in the hand. They are not affected by soaking in sea water.

The last number of the American journal, Modern Medicine and Bacteriological Review, draws attention to a report recently drawn up by Prof. Conn, of the Western University, on the bacteriology of milk, published by the United States Department of Agriculture. Examinations of milk made at various places yielded numbers varying from 330,000 to 9,000,000 microbes per ounce. The milk supply of Boston was found to be particularly rich in microbes, as many as 135,000,000 germs being found per ounce. The Boston Medical and Surgical Journal lately reported a case in which a young man contracted tubercular disease by drinking milk from a herd of cows, 59 of which were afterward found to be tuberculous, while two persons employed in making butter from the same herd, and who drank large quantities of milk, also became infected. Although much has been accomplished in our country of late years to improve the sanitary conditions surrounding our public milk supplies, yet a great deal still remains to be done, and there cannot be a doubt that the next important step will be the distribution by our dairies of "pasteurized" milk and butter. The example has already been set by one important London dairy company, and it is to be hoped that others will follow what is, after all, but a tardy imitation of what has been done for some time past by our more enlightened neighbors on the Continent.

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Are Health Resorts Dangerous?

The Journal of Hygiene, in a recent number, says: "Forty years ago, Mentone was a happy village in France, where lived peasantry happy in their farms and in their superb physical state, conditioned by the climate. It was discovered that the region was a most healing one for consumptives, and it became the Mecca for the unfortunates of Europe so stricken. The inhabitants abandoned their farms to wait upon the strangers. The strong, healthy women forsook their dairies and became the washerwomen of the consumptives' clothes. No precautions were taken; the disease was not then understood as now, the theory of tubercle bacillus not having been discovered. The place today is bacillus-ridden, a pest hole, death itself. The hitherto strong inhabitants are emaciated, a coughing, bleeding people, filled with the germs of consumption. The soil and air are both contaminated with the tubercle bacilli. It is no longer a health resort."

The same fate, it is believed, awaits many other similar localities unless active measures are taken to destroy all germs. This will be a most difficult task, because consumptives themselves, as a rule, are not thoughtful of the danger they spread, or of the rights of others. They should bear in mind that if all the others had been careful, they, too, might have escaped.

Glass of the Fifteenth, Sixteenth and Seventeenth Centuries.

Foremost stands Venice, which, at the beginning of the thirteenth century, obtained workmen from Constantinople, and founded workshops that were in full activity till 1291, when they were all transferred to the neighboring island of Murano. During the fourteenth century the principal manufacture consisted of beads, imitation jewels, etc., which found a ready market in Asia and Africa. In the fifteenth century an impetus was given to the manufacture, arising from the capture of Constantinople by the Turks, and the revival of ancient art in Italy; the former throwing the glass trade almost entirely into the hands of the Venetians, while the latter furnished the artist with fresh and valuable sources of design. It was not, however, until early in the sixteenth century that the very beautiful process of which so many and such exquisite varieties are to be met with in private and public collections was discovered—a discovery which at first was religiously kept secret by the manufacturers themselves, and against the divulgence of which the Venetian government passed most stringent orders and threatened the severest penalties; while, on the other hand, the glass makers who remained faithful and silent, content with Murano, were made citizens of Venice on that account alone, the highest official positions being open to them; indeed, such singular honor was paid to them, that masters of the art were looked upon as little inferior in dignity to the highest nobles, and special and peculiar privileges were extended to them.

During the whole of the sixteenth and seventeenth centuries Venice was the principal glass manufactory of all Europe, at which every conceivable variety for use and ornament was produced. Early in the eighteenth century the Bohemian manufactures became noted, and the cut glass of that country caught Fashion's ever variable fancy. From that period the art gradually declined at Murano, and the privileges of the glass makers were annuled. Then came the decay of the republic of Venice, and its destruction by the French at the close of the eighteenth century; since which time, although the manufacture of glass is still carried on at Murano, its glory has quite departed, and its principal trade again reduced to beads and ornaments.

More even than for the exquisite beauty and delicacy of its contours and proportions, Venetian glass is celebrated for its ornamental patterns in latticinio, or milk-white threadwork, enamel, etc. The principal and most characteristic varieties of the manufacture were:

(1.) Subjects in white or stained glass, ornamented with enamel colors and gilding.

(2.) Glass ornamented with latticinio, or small milk-white threads, which, either milk-white or otherwise colored, are inclosed in the glass. These are spirally twisted into a charming variety of patterns.

(3.) Pieces in which two sheets of thin glass are conjoined, so as to form a network of latticinio or other colored threads, between each mesh of which a small air bubble is formed. The extreme delicacy, exactness, and minuteness of these pieces have defied all efforts at successful imitation. The variety was known as vitro di trina (lacework glass).

(4.) Mosaic glass, in which slices of colored threads or reeds were placed within two layers of white glass, and fused into masses ready for forming vases, etc. This kind has been very successfully revived in the present century. It was termed millefiore or vitro fiorito (flowered glass).

(5.) Glass in which minute particles of gold are arranged in patterns and fused, or in which metallic filings were dropped in the process of fusion, so as to form patches or specks of gold, etc., called aventurine.

(6.) Dark mottled glass, of various colors, fused and blended, which, when held to the light, shows a deep ruby color. To this species the German word schmeltze has been applied.

Other varieties were named schmelz aventurine, a combination of the last with the gold specks of the aventurine; frosted or crackle glass, and frosted glass with masks, flowers, etc., blown in relief on it from within.

These are some of the principal processes found in old Venetian glass, which, besides the elegance of its forms already noticed, is remarkable for some most grotesque and curious designs in the shape of animals, fishes, nondescripts, etc., which are stated to have been chiefly in use for chemical purposes. Some of the foregoing processes have been imitated in other countries, but Venetian glass far surpasses them all in the beauty and variety of its outlines and the fragility of its material, which was of so delicate a nature that it was believed if poison were poured into certain of the finest specimens, the glass would break.

Germany, during the sixteenth and seventeenth centuries, manufactured a number of large glass goblets, ornamented with armorial bearings, figure subjects, foliage, and inscriptions in enamel colors, which afford much interest and information on contemporary events which commemorate the purposes for which they were often specially made.

Engraving on glass, though commenced with the diamond point by the Venetians in the sixteenth century, was carried to greater perfection by machinery in Germany, France and Holland, from the seventeenth century to the present time. Etching on glass by means of a powerful acid was also practiced in the seventeenth century, the discovery being attributed to Schwanhard, of Nuremberg, whose secret, however, died with him.

The first manufacture of glass established in this country appears to have been in the year 1557, at the Savoy House, in the Strand. In 1635 a patent was granted to Sir Robert Mansell for glass making, but it could not have been on any large or important scale, as the same patent empowered him to import Venetian glass. In 1670 the second Duke of Buckingham induced some Venetian workmen to settle in London, but ornamental glass making never prospered, and it was not until the present century that the higher branches of decorative workmanship have been successfully practiced, and their application extended to a great and increasing variety of subjects.

It may be remarked that in the arts of glass making, pottery and metal work, the East preceded and excelled the West in works of industrial art.—The Pottery Gazette.

Respirability of Air in which a Candle Flame is Extinguished.*

At the last meeting of the British Association the author stated the composition of artificial mixtures of nitrogen and of carbon dioxide with air which were just able to extinguish various flames. It was found that the flames of ordinary candles and lamps were extinguished by mixtures which contained on an average about 16·5 per cent of oxygen and 83·5 per cent of the extinctive gases. A flame of coal gas, however, required for its extinction a mixture still poorer in oxygen, and containing 11·3 per cent of oxygen and 88·7 per cent of the extinctive gases. These results have since been confirmed by a different method.

The method consisted in allowing the flames to burn in air inclosed over mercury until they were extinguished; the remaining extinctive atmosphere was then subjected to analysis, when its composition was found to be practically identical with that previously obtained from the artificial mixtures. An analysis of air expired from the lungs proved that it was also of the same composition as that which extinguished the flame of an ordinary candle or lamp. The average percentage composition of expired air and of air which extinguishes a candle flame is as follows: Oxygen, 15·9; nitrogen, 80·4; carbon dioxide, 3·7.

Now an atmosphere of this composition is undoubtedly respirable. Physiologists state that air may be breathed until its oxygen is reduced to 10 per cent. The maximum amount of carbon dioxide which may be present is open to question, but it is undoubtedly considerably higher than 3 per cent. Dr. Haldane maintains that the above atmosphere is not only respirable, but could be breathed by a healthy person without inconvenience of any kind; he further states that no permanent injury would result from breathing such an atmosphere for some time.

The conclusion to be drawn from these facts is that an atmosphere must not be considered to be dangerous and irrespirable because the flame of an ordinary candle or oil lamp is extinguished by it. The view is very generally advanced that a man must on no account venture into air which extinguishes the flame of a candle or of a bundle of shavings. It will be seen that this precaution may deter one from entering an atmosphere which is perfectly safe and respirable, and from doing duty of a humane or necessary character. An atmosphere which extinguishes a coal gas flame, however, appears to approach closely to the limit of respirability, as far as the proportion of oxygen which it contains is concerned. Hence the coal gas flame appears to be a more trustworthy indicator of respirability than the flame of a candle or oil lamp. Undoubtedly the candle and lamp flames should be discarded as absolute tests of the respirability of air.

*By Frank Clowes, D.Sc.—From the Engineering and Mining Journal.

Etiology and Pathology of Obesity.

Edgar Thompson, M.D., translates from L'Union Med. for the Medical Review the following as to the cause of obesity. As a general rule, obesity is more frequent in cold climates than in hot. The inhabitants of the extreme north are very fat from the great absorption of fatty foods, oils, etc. This superabundance of food with the increasing use of alcohol and a more indoor life is favorable to the production of fat.

The inhabitants of the torrid zone who live on a scant fruit diet and exercise constantly in the open air rarely fatten.

All authorities agree that alimentation plays a strong role in obesity, but the opinions as to the particular foods are not unanimous.

In the normal nutrition the fats introduced in the alimentary canal are broken up into glycerine and fatty acids, and the greater part is oxidized in the organism—body heat resulting from the combustion. The small amount which escapes immediate combustion accumulates in the various tissues and constitutes a reserve which can be utilized when the supply of fat, from without, fails. If the amount of foods are superabundant, or if their oxidation is incomplete, the equilibrium will be lost, and the fat will accumulate in the cellular tissues, causing obesity.

The inordinate use of albuminoids can contribute to obesity. Lean meat gluttons get fat. In the physiology of nutrition the albuminoids can be transformed into derivatives identical with fats and hydrocarbons. These fatty bodies arise when more albuminoids are presented than can be completely oxidized into urea, etc.; the surplus is incompletely oxidized into the fats.

Fat can also be formed from hydrocarbons (sugars). One part is oxidized in the organism, while the rest is transformed into fat (Liebig). Selon Beauniz explains the formation of fat in connection with hydrocarbons in a different way. He suggests that the hydrocarbons are not changed into fat at all, but being more easily oxidized than the fat in foods, they will be taken up for combustion in preference to the latter, and all of the ingested fat will, therefore, accumulate unchanged, producing obesity.

The author concludes that all kinds of foods can produce fat. Beverages can influence the deposition of fat. It is generally admitted that water, taken in large amounts, favors corpulency. Dancel's treatment of obesity is to limit the water drank by the patient. The alcoholic obese bloat is proverbial. Alcohol causes the accumulation of fat by limiting its oxidation. The alcohol acts as an easily combustible food and displaces the fatty foods by reason of its greater affinity for oxygen. This habit can be a cause of obesity.

Lack of muscular exercise hinders the oxidation of the fats as well as the other nutritive metamorphoses. Sedentary habits have a similar effect. In the female, obesity has a close connection with certain phases of genital life. Some women fatten immediately after marriage; others become obese after pregnancy; others still, after the menopause.

Frequently obesity develops from an accidental cause, change from an active to a sedentary life promotes it; sometimes it occurs after an acute febrile disease, as pneumonia and typhoid fever. All those nutritive changes which hinder the oxidation of fats promote obesity.

A Living Fossil.

Prof. Denny recently gave a demonstration to his students at Firth College, Sheffield, England, of a very unusual and interesting nature, says the Westminster Gazette. Among the most ancient of animals still inhabiting our planet is the so-called mud fish (Protopterus) of Africa—a creature worthy of our respect, if only in consideration of its vast antiquity, which dates far back in the early ages of the world. Of popular interest, the most striking feature of the mud fish is the possession of lungs as well as gills. On the approach of the dry season, in its natural haunts in Central Africa, the mud fish hollows out a chamber in mud, and enters upon a period of rest extending over many months, during which time it is without access to water, and breathes air only. While in the mud these fishes may be dug up, and survive even after a journey across the world in the dry state. Prof. Denny received a short time ago one of these mud blocks. In the presence of the students the hard block was placed in warm water, and after being thus exposed for nearly two hours the fish, which went to sleep in tropical Africa many months ago, awoke and came forth from its temporary sepulcher to find itself in a bath of tap water in the biological laboratory of Firth College, where it is now alive, and doubtless happy.

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