

ter. A professional man starting in life will be sorely tempted to this recklessness, wearily. Waiting for clients or patients, it is so very natural to think, "This cannot be the spot: I ought to be in another part of the city, or in another town," but it is the spot, only he isn't the man quite. He will be when he has become longer known in the neighborhood, when acquaintance has ripened into confidence, and confidence into experience of his professional ability. Great names, gentlemen, were once very small names, and large fortunes began with a dollar. Identify yourself with one place, and in due time you'll become as well known and well used as the penitentiary.

"The early bird catches the worm." I know malevolent wit has from this wholesome saw drawn an unhealthy conclusion about the stupidity of early worms, but you will not, I'm sure, be misled by those triflers. The adage means promptness, and promptness means self-denial, and self-denial is ugly. For it means getting out of a warm bed in the middle of a cold night to breast the storm for a mile or two; it means letting that smoking dinner go untouched; it means giving up that ride with your sweetheart just as you were going to be so comfortable in the buggy; it means, in short, everything, however disagreeable, when duty calls. If you are ever ready on call, people will be ready with their calls. They always count the prompt doctor the best doctor. Your skill will be of small avail without promptness to use it.

"Pleasant words are health to the bones," which may be also read, "A doctor's cheerfulness is often as good as his physic." I wish some one of you gentlemen would take the leisure of the next year—while you are waiting for patients—in studying the curative properties of cheerful manners in the sick room, and then publish your discoveries in a manual for Dr. Thomson to use with his classes. I don't suppose you could do much with scarlet fever or smallpox; but what a vast array there is of nervous diseases to which pleasant words would be like the breath of spring and the oxygen of the mountain top! Cheer up your patient, and you'll rectify the circulation; cheer up your patient, and you'll augment his nerve power; cheer up your patient, and all the tissues will revive. Medicine must sometimes be disagreeable, but doctors never. A physician's face should be like sunshine and his voice like wedding bells.

"Take care of the pennies, and the pounds will take care of themselves." Now, don't think I am going to preach pecuniary carefulness to you. No. I have quoted the proverb for quite another purpose. It is of time, not money, I would use it. Your whole life is to be given to science; to one of the noblest departments of scientific research and activity. You are therefore to grow in scientific knowledge. Your learned professors have only started you in the paths of exploration. But while you are to study, you are also, I trust, to be very busy in your practice. Of course, then, you cannot sit down and say, "I'll devote this week or this day to study." There's a sore throat over the way, and an erysipelas five miles off, that knock that pretty design in the head. You will have no long delicious sails on the sea of medical learning. But you will have scraps of time, five minutes here and a quarter of an hour there, coming along very tantalizingly, but nevertheless coming along between two calls or between sawing the wood and holding the baby. Now, these scraps of time are your very fortune. Add up the minutes and you are astonished that they amount to whole days, and many of them. Have a valuable treatise on some branch of your profession always open on your table or desk, with your open note book and pencil by its side. Drop into your seat and catch at least one idea. The five minutes are gone and away you go, but you have caught and fastened a new idea. Go on in that way and you'll have a mountain of them in a year. Use diligently your scrap time. Don't lounge. Don't think fifteen minutes are so short that there is no use in applying one's self to anything in particular. Save up these pennies of time, and then hurrah for the pounds.

"Obsta principis," which good old Matthew Henry translated by an English proverb, "Nip mischief in the bud." Begin your medical career with a careful avoidance or abandonment of bad habits, especially such as would harm your standing in the esteem and regard of your patients. A man whose clothes are saturated with stale tobacco smoke is not an agreeable visitor in a sick room. Nor is it reviving to a delicate organization to have stimulants applied through the physician's breath. Neatness in personal apparel and delicacy in manipulation may seem to be small matters, but I can assure you that their neglect may have a weighty influence toward failure.

Now, gentlemen, don't be proud because you are the world's benefactors. Beneficence can afford to be modest because its rank is so high. The real nobility need not be particular about publishing its titles. It leaves self-praise to quacks and mountebanks. Do your full duty as physicians, and you will have all the respect and praise that are your due without any effort to put feathers in your own cap.

THE LURAY CAVERN.

BY H. C. HOVEY.

(Continued from page 58.)

Stalactitic distortion is a new and fascinating study. The grotesque results have been repeatedly described, but the causes have been overlooked.

Consider, first, the normal growth of a stalactite. It is tubular and cylindrical. A drop of lime water, on evaporation, deposits a ring of its own diameter. The next drop makes a second ring exactly equal to the first, and cemented to it. Ring follows ring, in a continually lengthening tube, through which the water drips, never able to lay down its burden of carbonate of lime until it reaches the air. Myriads of these white and fragile tubes are to be seen thickly crowded together, from an inch to a foot in length, and sometimes extending for several feet from roof to floor.

When the flow of water exceeds the capacity of the tube, or the orifice is closed up, a series of layers will be formed by the overflow, thicker above than below. Thus the cylin-

forth are afterwards coated with layers of carbonate of lime. Fungi also play an important and hitherto unnoticed part in stalactitic distortion. Our attention was called to numerous fine, elastic bristles growing on stalactites and other kinds of dripstone in all parts of the cavern. Each carries a little ball at its extremity, usually enveloped by a globule of water. We further observed that the conditions often favored a thin deposit of the carbonate of lime on these bristles, so that their shaperemained after the substance had decayed. Many of these black setæ and white filaments were examined by the microscope, and the gradations were traced from the finest hairs up to great knots and tangled outgrowths.

This fungus is a new species of *Mucor*, to which I have affixed the specific name of *Stalactitis* (see Fig. 1), with the following botanical description, namely:

Mucor stalactitis.—Sporangia, globose, membranaceous, dehiscent by a fissure, terminating threads; sporidia, subglobose and separating; flocci, tubular, indistinctly par-titional, sometimes branching at the base, but never at the apex. Specific marks: sub-solitary threads; sporangia simple; height, one tenth to one half an inch; color, dark olive green; found on stalactites and other formations in caves; locality, Luray, Page county, Virginia.

My thanks are due to Professor D. C. Eaton, of Yale College, for aid in examining this beautiful fungus; and also to W. H. Miller, M.D., of Luray, for help in collecting specimens.

Among many examples of lateral outgrowths having fungi for starting points, a single one must suffice for description, selected as exhibiting an extraordinary result of this kind of interference. (See Fig. 2, reduced to one fourth natural size.) The distortion is so symmetrical as to argue design. From a large stalactite two tendrils have grown, which we are sure, from careful examination, did not originate with crystals, but with fungi. The trickling lime water was arrested by them in its descent along the surface, and made a thin deposit, which was increased until the projections caught calcareous drippings falling directly from the roof of the cave. A structure was thus built up, of considerable magnitude compared with its slender support, and in which the ordinary relations of stalactite and stalagmite are interchanged, the stalagmite being uppermost.

Luray Cavern continually yields new discoveries of surprising beauty as the reward of perseverance. Explorations have been lately pushed through a long corridor, having a central row of stalagmites running through its entire length, leading from Stonewall Avenue into a splendid hall, about 100 feet in diameter and equally high. It is located, according to our topographical examination, under a sink observed about 100 yards southwest of the mouth of the cave, and within 200 yards of the entrance to Ruffner's Cave at the summit of the hill. We daily expect to hear of the discovery of some communicating passage between these two caverns. There are proofs that the Indians explored these hidden recesses by some other means than the present entrance.

One day we mounted the huge masses of dripstone, near the Double Column, by means of a ladder. Then creeping a long distance, unwinding a ball of twine as a clew by which to return, and breaking hundreds of delicate stalactites that it seemed a pity to disturb, but that barred our way, we emerged on an eminence, whence with some difficulty we descended into a deep ravine. This locality was thought to be the furthest point from the entrance, so far as known. And there, by digging with our knives in the dry bed of an old torrent, we unearthed an arrowhead and a quantity of charcoal. At a later day a party found moccasin tracks near the

Double Column, covered by shallow water and incrustated by a thin coating of lime.

In a gulch near the Imperial Spring human bones are visible, including a jaw with three tooth sockets, the femur, the tibia, and the ribs, the latter fractured. The remainder of the skeleton is concealed under dripstone, for whose formation several centuries must have been required.

The conclusion that these are Indian remains would no doubt be confirmed by skillful exhumation, especially should any weapons or ornaments be thus brought to light. The unlucky adventurer, apparently a youth less than 18 years of age, is supposed to have lost his way amid the darkness, and to have fallen from the cliff at whose base his bones now lie entombed in alabaster.

We found in all parts of the cave vestiges of former occupants of the humbler forms of life, and especially observed thousands of tracks once made by rats, rabbits, raccoons, and wolves. In one locality we pursued bear tracks to a spot where bruin had left long scratches on a stalagmite not yet healed over. All these impressions looked fresh, but could not have been so, for it is years since any wild beasts have appeared in the vicinity. Marks in the tenacious clay might remain unchanged for centuries.

Various layers of excrementitious matter were noticed, and also many small bones of mice and bats, along with casts of

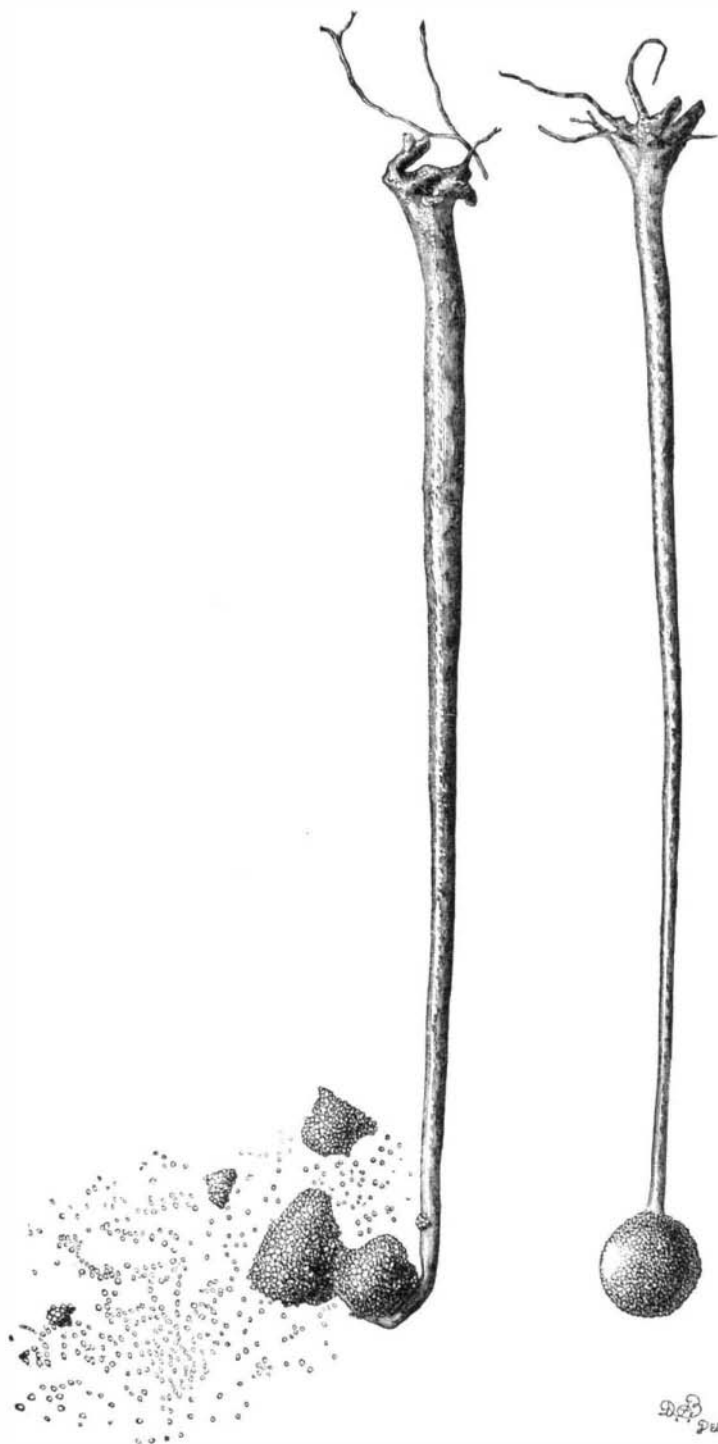


Fig. 1.—MUCOR STALACTITIS.—FROM LURAY CAVERN.

der is transformed into an elongated cone. The distortion of these simple shapes cannot be due to fluctuations of the air, as in the case of icicles; nor to varied resistance of the medium penetrated, as in roots piercing the soil; nor to parasitic punctures, as in vines and stems, although simulating all these abnormal growths. Such causes are not in operation here. What agencies, then, have produced these extraordinary results?

Crystallization is one of the causes sought. A delicate tassel is often formed on the tip of a stalactite; it sometimes envelops the entire tube. The same growth also shoots up from blocks of limestone and nodules of flint, and from its resemblance to petrified moss, it is generally so called. But each pointed leaf is really a brown, yellow, or white crystal of aragonite, occasionally prismatic in shape, and more rarely rounded like delicate fruitage. The indications pointed to a temporary submersion, at some time, of the substance to which the clusters were attached.

On a renewal of stalactitic growth, the fresh deposit would, of course, be exterior to these increments, causing many curious distortions. The tassel, by incrustation, becomes a bulb. The enlargement is often so great as to inwrap contiguous stalactites, whose primary tubes appear, by a transverse section, like pipe stems piercing the excrescence.

Uncouth expansions grow wherever crystals having shot

worms. A few large bones have been gathered up, but not yet identified. We recognized the skeleton of a squirrel, the jaw of a raccoon, the jaw and teeth of a large carnivore (possibly a panther), the skull of a wolf, and the skull of a deer that was probably dragged in from above, as it was gnawed by rodents. All the animal remains thus far met with are geologically recent, although the cavern itself must be older than the Tertiary period.

Scientific cave digging has not yet been begun at Luray. This would require a thorough breaking up of the stalagmitic floor down to the solid limestone, followed by an exhaustive examination of the contents in vertical slices. The process need not injure objects of general interest, if limited to portions not now open to the public; and it would almost certainly be rewarded by valuable archaeological discoveries.

The list of living fauna is meager, including one rabbit, twenty bats, and numerous small black spiders. The latter were probably brought in with the lumber and other material used in making walks and stairways.

It was taught by Agassiz, and has long been the popular notion, that the various forms of aquatic life existing in caverns were originally created within the limits over which they now range and with the structural peculiarities now belonging to them. But it is doubtful if there is more variability than can be explained by supposing simple retardation through successive generations. For example: the well-known *Amblyopsis spelæus* has congeners enjoying perfect vision. Cave rivers contain fish with eyes, with sightless eyes, with mere protuberances instead of eyes, and finally those destitute of even rudimentary visual organs. Gradations of color and osseous structure correspond. It is certain, moreover, that subterranean streams feed open rivers, with which many of them are so connected, at high water, as to be easily replenished by familiar fluvial forms.

Were the old hypothesis correct, we ought to find living objects in the pure and wholesome waters of the Luray Cavern. But, so far as we could learn, those beautiful basins, transparent as air, and lined with white crystals, so that every portion is clearly visible, are totally uninhabited, however broad and deep; and the sole assignable cause for such remarkable barrenness is their isolation from outer streams.

Only six very small gravel-cut domes were found. They are located in Stebbins Avenue, and they seem but copies, on a greatly reduced scale, of those lofty domes of the Kentucky caves that cut clear through from the soil to the drainage level. Yet the cavern floors are traceable, and we satisfied ourselves of the existence of four distinct tiers. The vertical distance from the highest gallery to the lowest pit is about 220 feet. Basins are found at every altitude; all filled by percolation. Our visit was just after very heavy rains, and the walls were everywhere dripping, but no running streams appeared, although dry torrent beds are common. These all belong to the ancient history of the cave.

There is an extraordinary rift near Brodus Lake. We traced it for over 500 feet. Its width varies from 1 to 2 feet, and it seems to have been caused by the settling of the rocks in consequence of having been undermined. Interiorly it slants at an angle of 30° from the perpendicular. Campbell, who is a daring climber, had already, as he informed me, descended by the aid of a rope 50 feet long till the end of it was reached, without touching bottom. In my company two other trials were made at more favorable points, and without a rope; but in each instance the edge of a pit was reached, whose depth was not ascertained, but was thought to be not more than 20 or 30 feet.

Could this lowest floor of all be reached, which must in the nature of the case be nearly down to drainage level, we anticipate the discovery of running streams containing fish, crustacea, and fresh water algae; and we confidently predict that, allowing for retardation, they will be found to resemble species now existing in the Shenandoah river and its tributaries.

SOME RECENT INVENTIONS.

An improved process of hardening, toughening, and increasing the homogeneous character of metal castings and alloys, has been patented by N. W. Williams, of Philadelphia, Pa. It consists in applying to the surface of the molten metal pieces of horn or other analogous material.

A barbed wire or cable for fences, having a new form of double or interlocked barb, invented by Mr. Joseph Winterbotham, of Joliet, Ill., has double pointed barb sections, bent in a peculiar manner and combined with a duplex cable, so that the barbs cannot loosen or become detached.

An improvement in rubber horseshoe pads, patented by William A. Taylor, of Washington, D. C., has a beveled flange that projects down inside of the shoe to avoid balling, and it is capable of being expanded to suit the size of the hoof.

An improvement in suspenders, which provides for supporting both pantaloons and drawers, or pantaloons and overalls, invented by Mr. William A. Miller, of Martinsville, Ill., is contrived so that both garments will be supported properly without liability to disarrangement.

An improved roofing tile, in which provision is made for rendering the joints secure, has been patented by Mr. Edwin Bennett, of Baltimore, Md. This tile is diamond-shaped, and has marginal ribs at its two upper edges, and is provided with downwardly projecting ribs at its two lower edges for engaging the upper ribs of the adjacent tile; it also has a channel which constitutes a rib seat, and is entirely covered by the tile which overlaps it.

A simple and sure fastening for hames has been patented by Mr. Joseph Frank, of New York city. It consists in the combination of hook plates and a lever for throwing one of the plates into engagement with the other, and a spring-action catch for retaining the lever.

What to Do in Cases of Diphtheria.

From the Circular of the Massachusetts State Board of Health.

In the first place, as diphtheria is a contagious disease, and under certain circumstances not entirely known, very highly so, it is important that all practical means should be taken to separate the sick from the well. As it is also infectious, woolen clothes, carpets, curtains, hangings, etc., should be avoided in the sick room, and only such materials used as can be readily washed.

All clothes, when removed from the patient, should be at once placed in hot water. Pocket-handkerchiefs should be laid aside, and in their stead soft pieces of linen or cotton cloth should be used, and at once burned.

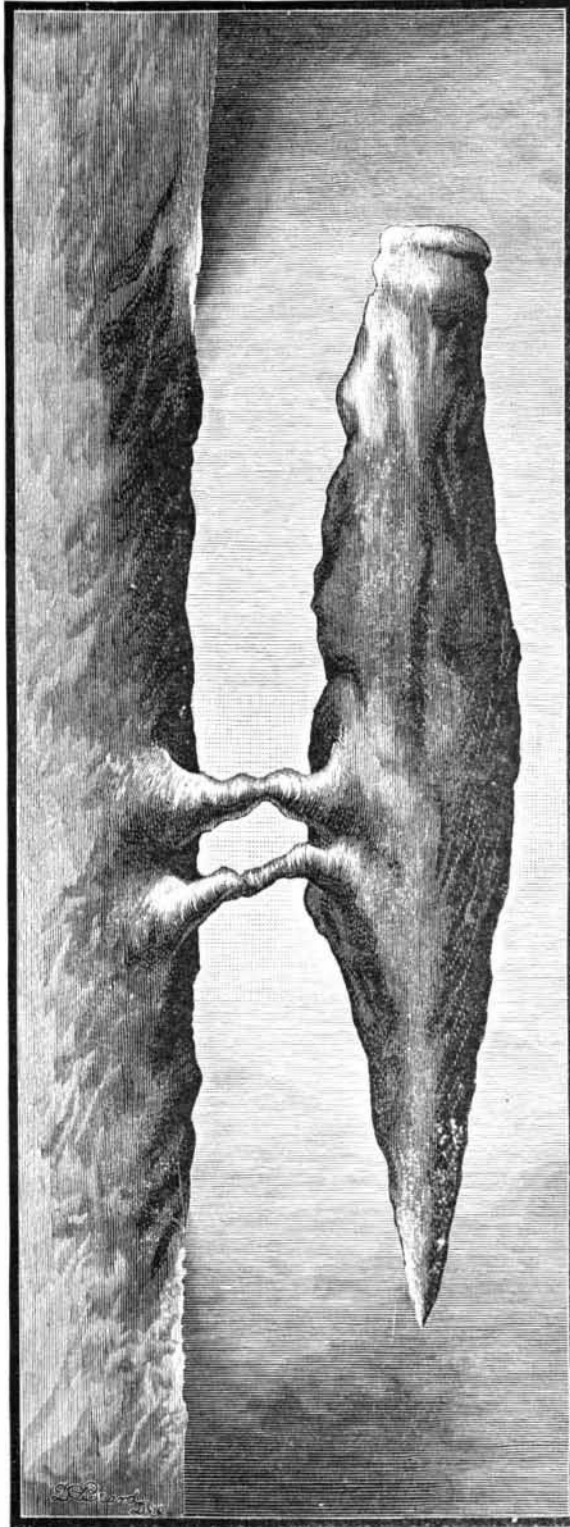


Fig. 2.—CURIOUS STALACTITE GROWTH.—FROM LURAY CAVERN.

Disinfectants should always be placed in the vessel containing the expectoration, and may be used somewhat freely in the sick room; those being especially useful which destroy bad odors without causing others (nitrate of lead, chloride of zinc, etc.). In schools there should be especial supervision, as the disease is often so mild in its early stages as not to attract common attention; and no child should be allowed to attend school from an infected house, until allowed to do so by a competent physician. In the case of young children, all reasonable care should be taken to prevent undue exposure to the cold.

Pure water for drinking should be used, avoiding contaminated sources of supply; ventilation should be insisted on, and local drainage must be carefully attended to. Privies and cesspools, where they exist, should be frequently emptied and disinfected; slop water should not be allowed to soak into the surface of the ground near dwelling houses, and the cellars should be kept dry and sweet. In cities, especially in tidal districts, basins, baths, etc., as now connected with

drains, should never communicate directly with sleeping rooms.

In all cases of diphtheria, fully as great care should be taken in disinfecting the sick room, after use, as in scarlet fever. After a death from diphtheria, the clothing disused should be burned or exposed to nearly or quite a heat of boiling water; the body should be placed as early as practicable in the coffin, with disinfectants, and the coffin should be tightly closed. Children, at least, and better adults also in most cases, should not attend a funeral from a house in which a death from diphtheria has occurred. But with suitable precautions it is not necessary that the funeral should be private, provided the corpse be not in any way exposed.

Although it is not at present possible to remove at once all sources of epidemic disease, yet the frequent visitation of such disease, and especially its continued prevalence, may be taken as sufficient evidence of insanitary surroundings, and of sources of sickness to a certain extent preventable.

It should be distinctly understood that no amount of artificial "disinfection" can ever take the place of pure air, good water, and proper drainage, which cannot be gained without prompt and efficient removal of all filth, whether from slaughter houses, etc., public buildings, crowded tenements, or private residences.

Manufacturers' Troubles in England.

A correspondent writes to the *Kidderminster Shuttle* the following account of great ingratitude on the part of some weavers employed at one of the carpet manufactories in Stourport. An important order was received by a firm for immediate execution, and a short time before Christmas information was received that the carpets ordered were urgently wanted. The manager saw the weavers engaged on the order, and urged them to lose no time in the completion of the work, and asked them to work overtime. The men informed the manager that it was against the rules of the association of which they were members to work overtime; and, as there appeared no possibility of the order being completed by the time required, the manager set several young men on some looms to work overtime, and by this means the order was duly executed. The firm, with the view of preventing any bickerings among the men, allowed the weavers engaged on the order to charge full price for all the carpet woven by the young men, while the firm paid the youths handsomely for all the overtime made by them. A few days after the men had received the money earned by the youths a deputation of weavers waited upon the principal of the firm, and protested against the employment of the youths on the looms, and, in addressing his employer, one of the deputation urged that if the person ordering the carpets wanted the order executed in such haste, he should have distributed the order among the several firms in the town!

Large Libraries.

By far the largest library in the world is the National Library at Paris, which in 1874 contained 2,000,000 printed books and 150,000 manuscripts. Which the next largest is, it is difficult to say, for the British Museum and the Imperial Library of St. Petersburg both had in 1874 1,100,000 volumes. After them comes the Royal Library of Munich with its 900,000 books. The Vatican Library at Rome is sometimes erroneously supposed to be among the largest, while in point of fact it is surpassed, so far as the number of volumes goes, by more than sixty European collections. It contains 105,000 printed books and 25,500 manuscripts. The National Library at Paris is one of the very oldest in Europe, having been founded in 1350, while the British Museum dates from 1753, or a time more than 400 years later. In the United States the largest is the Library of Congress at Washington, which in 1874 contained 261,000 volumes. The Boston Public followed very closely after it with 260,500 volumes, and the Harvard University collection came next with 200,000. The Astor and Mercantile, of New York, are next, each having 148,000. Among the colleges after Harvard's Library comes Yale's with 100,000. Dartmouth's is next with 50,000, and then come in order Cornell with 40,000; the University of Virginia with 36,000; Bowdoin with 35,000; the University of South Carolina, with 30,000; Ann Arbor, 30,000; Amherst, 29,000; Princeton, 28,000; Wesleyan, 25,500; and Columbia, 25,000.

Australian Letters.

E. C. H., Sydney, N. S. Wales, writes: It would be well for all American correspondents to know that unless their letters, etc., addressed to Australasia are marked "via San Francisco," they are sometimes sent by other routes, causing much trouble and annoyance to the recipient. E. C. H. knows several cases where circulars in a sealed envelope have been charged from 40 to 60 cents on delivery in Sydney, because they were received "via Brindisi," no route being marked on the envelope.

The Egg Trade.

The traffic in eggs in this country is estimated by competent authorities to equal \$180,000,000 a year. The barreled eggs received yearly at New York reach over 500,000 barrels, valued at \$9,000,000, and this is but one branch of the trade. It is said that Philadelphia consumes 80,000 dozen eggs a day. The receipts in Boston for the year 1878 were over 6,500,000 dozen. Between 5,000,000 and 6,000,000 dozen are annually exported from the country. The millions of dozens consumed throughout the country without passing into dealers' hands, it is impossible to estimate.