

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.

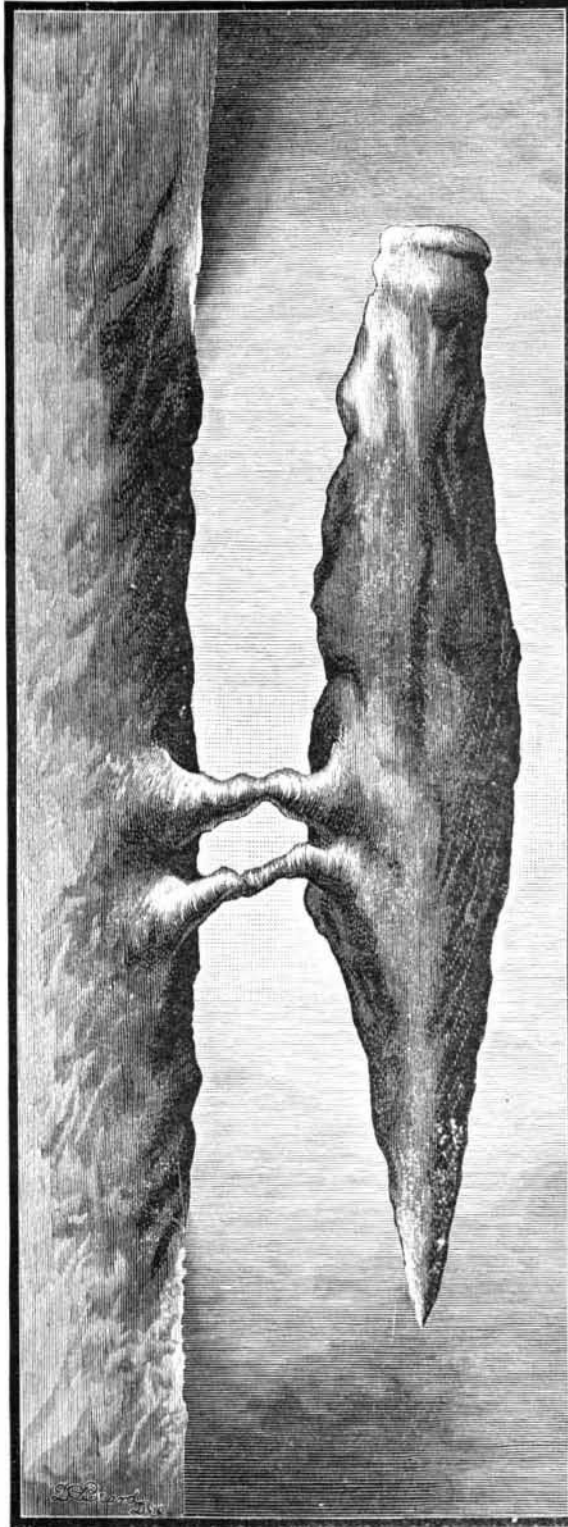


Fig. 2.—CURIOUS STALACTITE GROWTH.—FROM LURAY CAVERN.

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.