with white. It grows towards the end of autumn in plantations of willows, poplars, and oaks, on clayey soil. Sometimes it occurs in open cultivated fields. The odour of the mature fungus is very potent, and is like strong garlic, onion, or decaying cheese. *T. brumale,* referred to above, grows in Britain. It is a winter truffle, and is found chiefly under oaks and abele trees from October to December. It is black in colour, globose, more or less regular in shape, and is covered with sharp polygonal warts ; the mature flesh is blackish grey marbled with white veins. The odour is very strong and lasts a long time ; the taste is generally esteemed agree­able. *Chœromyces meandrifοrmis,* which occurs in Britain, is some­times sold for T. *magnatum,* the colour of the flesh of both species being somewhat similar. *Scleroderma vulgare,* the " false truffle, ” *is* extremely common on the surface of the ground in woods, and is gathered by Italians and Frenchmen in Epping Forest for the inferior dining-rooms of London where Continental dishes are served. It is a worthless, offensive, and possibly dangerous fungus. A true summer truffle, *T*. *mesentericum,* found in oak and birch woods on calcareous clay soil, is frequently eaten on the Continent. It is esteemed equal to *T. æstivum.* It probably grows in Britain. Another edible species, *T. macrosporum,* also grows in Britain, in clayey places under young beeches and oaks, on the borders of streams and roads, and sometimes in fields ; more rarely it grows in plantations of willow and poplar. It has a strong scent of onions or garlic. *Terfezia leonis,* a famous truffle of Italy, Algeria, Sardinia, &c., resembles externally a potato. It grows in March, April, and May. Some persons eat it in a raw state, sliced, and dipped in oil or egg. It is not scented, and its taste is generally considered insipid or soapy. Sometimes an ally of the puff-balls, and therefore (like *Scleroderma)* not a true truffle, *Melanogaster variegatus,* is eaten in England and France. It has been, and possibly still is, occasionally sold in England under the name of “red truffle.” It is a small ochreous brown species with a strong aromatic and pleasant odour of bitter almonds. When the plant is eaten raw the taste is sweet and sugary, but when cooked it is hardly agreeable. The odour belonging to many truffles is so potent that their places of growth can be readily detected by the odour exhaled from the ground. Squirrels, hogs, and other animals commonly dig up truffles and devour them, and pigs and dogs have long been trained to point out the places where they grow. Pigs will always eat truffles and dogs will do so occasionally ; it is there­fore usual to give the trained pig or dog a small piece of cheese or some little reward each time it is successful. Truffles are repro­duced by spores, bodies which serve the same purpose as seeds in flowering plants ; in true truffles the spores are borne in transparent asci or sacs, from four to eight spores in each ascus. The asci are embedded in vast numbers in the flesh of the truffle. In false truffles the spores are free and are borne on minute spicules or supports. The spores of the chief European truffles, true and false, enlarged five hundred diameters, are shown in the accompanying illustration. Many references to truffles occur in classical authors. The truffle *Elaphomyces variegatus* was till quite recent times used, under the name of Hart’s nut or Lycoperdon nut, on account of its supposed aphrodisiac qualities.

TRUMBULL, the surname of more than one individual of note in the literature, art, and politics of America.

1. Benjamin Trumbull was born at Hebron, Connecti­cut, on 19th December 1735, and died at North Haven, Connecticut, on 2d February 1820. He graduated at Yale in 1759, and entered the ministry. His literary work was considerable, the most important being the standard *His­tory of Connecticut* to 1764.

2. John Trumbull was born at Waterbury, Connecti­cut, on 24th April 1750, and died at Detroit, Michigan, on 12th May 1831. He graduated at Yale in 1767, and became a lawyer and author of high reputation. His best work is *M'Fingal,* a Hudibrastic poem, intended to serve the Whig side in the American Revolution.

3. John Trumbull, son of the following, was born at Lebanon, Connecticut, on 6th June 1756, and died at New York City, on 10th November 1843. He graduated at Harvard in 1773, studied painting with Benjamin West in London, and left at his death a number of historical works. The earlier of these are the better ; the later and larger were painted for the capitol at Washington.

4. Jonathan Trumbull was born at Lebanon, Con­necticut, on 10th June 1710, and died at the same place on 17th August 1785. He graduated at Harvard in 1727, and became a lawyer and colonial politician. His place in American history was gained as governor of Connecticut from 1769 until 1783, through the whole period of the American Revolution. He was a trusted supporter and confidential adviser of Washington, who was accustomed to speak of him as “ brother Jonathan,” and the term has since passed into popular use as equivalent to the people of the United States.

5. Jonathan Trumbull, son of the preceding, was born at Lebanon, Connecticut, on 26th March 1740, and died at the same place on 7th August 1809. He graduated at Harvard in 1759, and served as member of congress, 1789-95 (being speaker of the house of representatives dur­ing the last two years of his term), as United States senator, 1795-96, and as governor of Connecticut, 1798-1809.

TRUMPET, a musical instrument, consisting of a long, narrow brass tube, cylindrical for the greater part of its length : the fusiform development which terminates in the bell or opening of the lower end only begins at a point that varies from a third to a fourth of the total length from that extremity. The air inside is set in vibration by the lips (which act as true reeds) applied to the edges of a basin-like mouthpiece fitted to the upper part of the instrument. The material has nothing to do with the production of that brilliant quality of tone by which the trumpet is so easily distinguished from every other mouth­piece instrument : the difference is partly due to the dis­tinct form given to the basin of the mouthpiece, but prin­cipally to the proportions of the column of air determined by the conical or cylindrical form of its envelope.

The possibility of producing sonorous disturbance of a mass of air through a mouthpiece, or more simply through the orifice of the tube, has been known from a very early period,—a shell bored at its extremity, or a horn with the point removed, being without doubt the most ancient instrument for producing sound. Nearly all the nations of antiquity had mouthpiece instruments ; but the greater number of these, though grouped under the general de­signation of trumpets, have only a very distant relationship to the modern instrument. The Romans had four such instruments,—the *tuba, buccina, cornu,* and *lituus.* The tuba, represented in the bas-reliefs of the triumphal arch of Titus, was a kind of straight bronze clarion, with a conical column of air. It is ordinarily designated the Roman trum­pet, and was about 39 inches long ; its compass should not go beyond the first six proper notes of the harmonic scale. The Roman tuba and the Greek salpinx are supposed to be one and the same instrument. The buccina was also of bronze, with a tube measuring fully 11 feet in length. The tube is only slightly conical, and the quality of tone bears a striking resemblance to that of the bass trombone in G ; the proper tones for har­monics were those sub­joined.@@1 The cornu was often made of a bullock’s horn, but bronze was also employed,

@@@1 The difficulty of producing the fundamental or first proper note increases with the length and narrowness of the tube. The propor­tions of the buccina render the production of this note very difficult.