

A MICROSCOPIC AQUARIUM.

Our engraving represents a microscopic aquarium, such as would be seen if there could be embraced, at a single view in the instrument, the majority of objects examined by the microscopist, when the wonders of the infinitely little world existing in stagnant fresh water are studied.

The illustration, for which we are indebted to *La Nature*, though presenting a somewhat fantastic appearance, is, nevertheless, simply a combination of separate observations. The objects were drawn from their images on the field of the microscope, and then grouped so as to show their positions during the natural state.

All have their names. At the upper portion of the picture is a scrap of reed stem, a thin branch like a stalk of straw, beneath which a crowd of *confervæ* have sought shelter against the agitations in the water. The parasite life of the latter is necessary for their existence, because of their extreme delicateness. The diatoms, which are placed beside the *confervæ*, are represented in their natural state, that is, pendent in bunches. The *diatoma vulgare*, which is the variety shown, is found in so great abundance that hundreds of thousands are often united in a single group. They propagate themselves in indefinite clusters, united by delicate though strong membranes.

At the lower part of the aquarium are shown *confervæ* less elementary than those above. These do not become parasites, and, in fact, have some relation to aerial vegetation. Such are the *characæ*, the *batrachospermæ*, and the multitude of *algæ*, which are often taken for simple mold. In the midst of the vegetation, which appears to belong to another world, are infusoria of all sizes, from the proteus, a mere gelatinous mass, to the superior organisms furnished with exterior members.

If the infinity of forms which aquatic vegetables assume in some stagnant pool be examined, it will be found that all the floating bits of stick and the stalks of the weeds growing in the water are covered with a light brown and adherent slime. This is composed of a mass of *confervæ*. If one of these stalks be removed and placed in a flask of clean water, it may be transported and submitted to scrutiny under the microscope, when nearly all the species represented in our engraving will be recognized. Sometimes the observer will see a *spirogyra* with its heliocoidal shape of a brilliant green, sometimes scattered diatoms. Frequently hideous infusoria suddenly appear, a mass of gelatinous substance, in the midst of which something resembling viscera may be traced.

Microscopy is one of the most beautiful studies in the world; and to those of our readers whose coming summer will be passed in the country, we would recommend the purchase of a moderate priced instrument. To one not familiar with its revelations, the microscope opens a new world, and, in the drop of stagnant water, in the grain of earth, and in the leaf, shows wonders which are a constant source of surprise and admiration.

REMARKABLE BALLOON ASCENT.

Aerial navigation, since Science has utilized the balloon for the purpose of observation and investigation, has received a fresh impetus. Though Biot and Gay Lussac, as early as the year 1804, gave the first impulse to the employment of balloons for scientific research, it was not until the British Association for the Advancement of Science laid down (in Leeds, in 1858) the first systematized plan that regular balloon ascents were undertaken. Among a number of very valuable results ascertained thereby, the existence of a warm current of air, which sweeps (at an altitude of about 18,000 feet, and with a vertical magnitude of 2,000 feet) from the southwest to the northeast, in about the same direction as the Gulf Stream, has been discovered.

The French have hitherto undoubtedly held the foremost rank in aerial navigation. They showed, during the siege of Paris, the practical value of the balloon. The French papers are now seriously discussing a proposition for transferring the work of the surveyor to the aeronaut. It has been found necessary to revise the real estate maps throughout France, and it is proposed that an aeronaut should take a photograph of each tract or section, which would, after being suitably enlarged, exactly indicate the contour and features of the district. This may be practically accomplished, as such photographs have already been made from a balloon; but the expense of carrying such a plan into execution, being estimated at about three and a half million dollars for the whole country, is so large that the work may at present be done at less cost by a surveyor.

MM. Croce-Spinelli and Sivel made, on March 22, a balloon ascent under the auspices of the Society for Aerial Navigation, to which we alluded on pp. 280 and 337 of

our current volume. We give an illustration showing the aeronauts in the car. They carried with them, as we have stated, a considerable quantity of oxygen, inclosed in suitable vessels, and inhaled by means of a tube. By similar means life can be supported at an altitude where the rarity of the atmosphere is such as to make breathing impossible. This latter was the main obstacle to higher ascents, and it has now been successfully overcome, and it is possible to remain at altitudes of 30,000 feet as long as the oxygen lasts.

Of the many observations which were made by these aeronauts at heights up to 21,000 feet, we will mention only two. At 12,500 feet above the earth, they passed a cloud of suspended ice crystals, which glittered in the sun, but were so

porations from the sun, while others assert that they are moist vapors in our atmosphere. The latter view is now known to be the correct one, as the solar spectrum showed, in the dry air of the upper altitudes, no water at all.

Stalactites from Masonry.

The North Bridge, which spans the deep valley lying between the Old and New Towns of Edinburgh, Scotland, was built upwards of a hundred years ago. Between the arches of the bridge and the roadway above are a number of chambers or vaults which have not been opened, till recently, since the bridge was built. One of them has been visited by Professor Geikie, who says:

"From the vaulted ceiling, and especially from the joints of the masonry, hung hundreds of stalactites—delicate spar icicles of snowy whiteness. In many cases they reached to the floor, forming slender thread like pillars. Usually they were slim stalks, somewhat like thick and not very well made tobacco pipes; but towards the sides of the vaults they became thicker and stronger, or which we carried off measuring about four feet in length, and as stout as an ordinary walking stick. The same material as that forming the stalactites spread in ribbed sheets down the sides of the vault. The floor, too, was dotted all over with little monticules of the same snow-white crystalline spar.

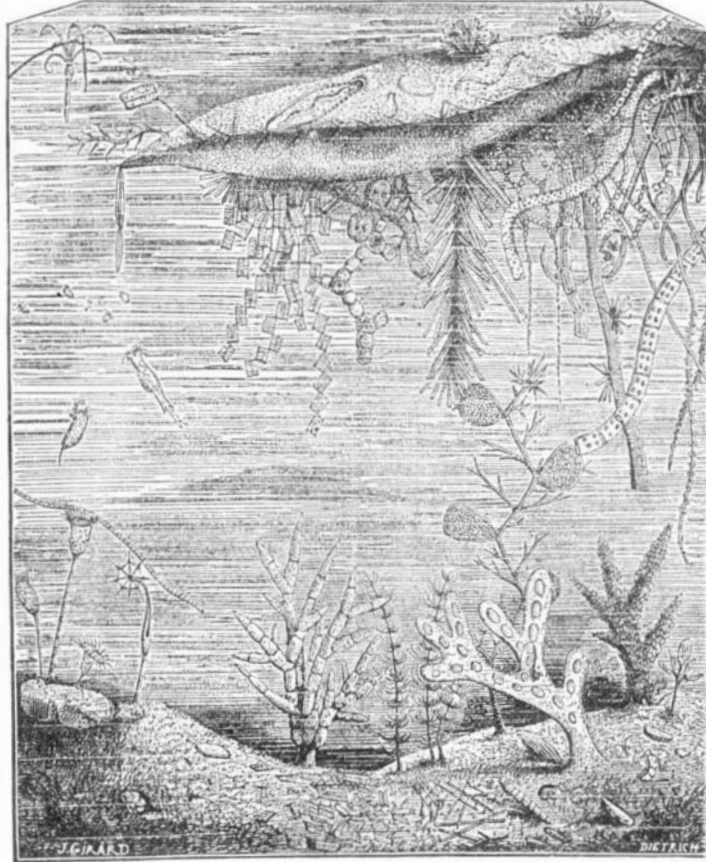
"A more illustrative example of a stalactitic cavern could not be found. The whole process was laid open before us in all its stages. Along the joints of the masonry overhead could be seen here and there a drop of clear water ready to fall. At other places the drop hung by the end of a tiny white stone icicle, to which it was adding its own minute contribution as it evaporated. From the mere rudimentary stumps, the stalactites could be traced of all lengths until they were found firmly united to the spar hillocks on the floor. Every one of these hillocks, too, lay directly beneath the drip, catching the remainder of the stone dissolved in the dropping and evaporating water. In every case the stalactites were tubes; even the thickest of them, though it had undergone great changes from deposit on its outer surface, retained, nevertheless, its bore. Usually there hung a clear water drop from the end of the stalk, ready to descend upon its white stony mound beneath.

For a hundred years this delicate tapestry has been hanging and growing, and breaking and growing again, quietly in darkness, beneath the grind of our carriage wheels, and yet high in air, with the stream of human life flowing underneath it too.

"As the bridge is built of sandstone, wholly or almost wholly free from lime, it is evident that the material which has converted these vaults into such picturesque caverns has been derived from the mortar. All rain water, as is well known, takes up a little carbonic acid from the air, and of that acid there is in the air of a town usually more than the normal proportion. Filtering through the masonry, it dissolves the lime, carrying it downward in solution, and, if made to halt and evaporate, depositing it again in the form of the white crystalline substance which we call spar. It would be a curious question for the architect how long his masonry could resist this action. Certainly, in spite of what these vaults in the North Bridge reveal, the masonry of that structure is, to all appearance, as solid and firm as ever. It is evidently impossible, however, that the mortar, if necessary at all, can be piecemeal removed without in the end causing the destruction of a building."

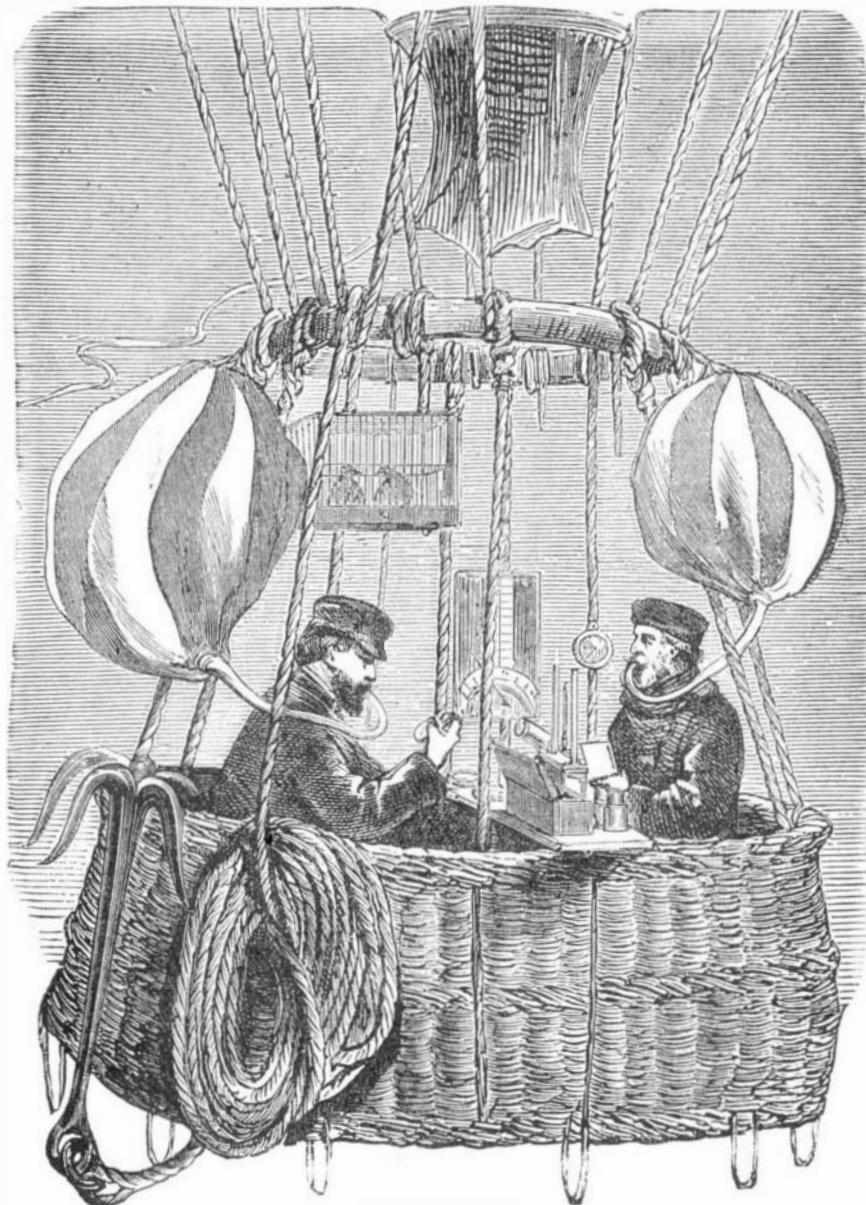
Oyster Culture in America.

Frank Buckland, in *Land and Water*, says:—"As regards the cultivation of the New York oysters themselves, I must again hold up a warning hand to American proprietors. If they go on with the present system, the oysters will shortly run short. I protested, some months back, against burning the culch old shells for lime, instead of putting it back to catch spat; and now I find they are selling their broods attached to the parent shell. I have picked out specimens from the tub at Scott's, at the top of the Haymarket. On the two shells of one edible oyster there were no less than twenty-three spats. In another case I counted a "clump." Two edible oysters only were in this clump, but it was covered all over with spat; so that for the sum of 4 cents, between thirty and forty oysters were sold all at once, only two being edible. The tub at Scott's was piled with examples of this "economy." I trust the American oyster dealers will not take it amiss if I warn them that, if they sell their young stock in this wasteful manner, they will soon be suffering from an oyster famine."



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perfectly translucent that a clear view of the panorama below the balloon was seen, and it was not in the least blurred. The second point is one of great importance. The lines indicating water in the solar spectrum have created much discussion; and Father Secchi argued that they were watery eva-



THE BALLOON ASCENT OF MM. SIVEL AND CROCE-SPINELLI.