# MISCELLA NEOUS.

#### Scientific and Practical Ballooning.

Ballooning owes its origin to the discovery, about 1780, of hydrogen gas, by Cavendish, in England, and its extraordinary lightness. The first experiments to prove its levity were made proper. They attached a car to a balloon, in which small animals were placed.

which small animals were placed.

The first human being to ascend was M. Pelatre, who ventured up to a hight of about 100 feet, with a rope attached to the car, by which it was drawn back. The same gentleman, accompanied with a friend, soon afterwards made an ascension to a hight of 3,000 feet, descending at a point about five miles distant. From this time the art of ballooning made rand progress.

tant. From this time the art of ballooning made rapid progress.

It was at once made subservant to purposes of meteorology and physics, and as early as 1794, during the French revolution, was employed by the French as a military machine for making reconnoisances. The officers sent up communicated their observations to the earth by signaling with flags. The French army in Algiers, in 1830, were also provided with balloons. But the most important and really practical use to which that machine has been put was its war uses during the siege of Paris, when that city depended almost entirely upon her balloons and the carrier pigeons which they took away for intercourse with the outer world.

During that memorable siege 65 balloons is were sent up from the beleagured city, carrying in all 91 passengers, 363 pigeons and two and a half million letters. Only five of all this number fell into the hands of the German army, two descended on German territory and were

two descended on German territory and were captured, while one disappeared entirely. The fragments of another were found hanging on a tree at Port Natal, in south-eastern Africa, having traversed almost lengthwise across that continent. Where it dropped its unfortunate companies was never known. All the others

continent. Where it dropped its unfortunate occupants was never known. All the others, 56 in number, descended safely beyond the radius of the besieging army in France, or upon neutral territory beyond.

The two great physicists, Biot and Gay-Lassac, made two ascents in 1804, to decide some important meteorological questions. They brought back from a hight of about 20,000 feet a sample of the air, which was carefully examined and found to be identical in character with that at the surface, a matter, at

The great problem of steering balloons has been studied and experimented upon by many of the ablest scientists and machinists in France and the world, but hitherto with no France and the world, but hitherto with no very satisfactory success. Dupay, commissioned by the Paris Academy of Sciences in 1872, has probably met with a larger measure of success than any one else, and has probably very nearly reached the ultimate in that direction. He gave his balloon a fish shape, and fitted it with an internal, or secondary balloon, containing more or less air and equal in bulk to one-tenth of the main balloon. The air could be let out of the inner balloon by valves, and drawn in again by an apparatus placed in could be let out of the inner balloon. The air could be let out of the inner balloon by valves, and drawn in again by an apparatus placed in the car. This arrangement was employed to supersede the use of tallast. He used a propelling screw turned by man-power, instead of steam, which latter was ignored, the strength of eight men being employed instead. His balloon carried in all 14 persons, and traveled about 60 miles. He carried an apparatus by which he was enabled to measure his speed, and also that of the wind. His balloon moved at the rate of about 540 feet per minute, while the wind was moving at the rate of about 2,900. The course of the balloon was at an angle of 12 degrees to the direction of the wind.

In this experiment the problem of steering was solved, although only to a slight degree—sufficient for only a very moderate movement of the air, but quite insufficient for anything like even a moderate breeze. This experiment is quite sufficient to show the inability of any attempt to make ballooning practical for any any attempt to make ballooning practical for any any attempt to make ballooning practical for

any attempt to make ballooning practical for any other purposes than those of war, where the enses of carrying a messenger to or from a beleaguered city or army are never taken into

# Hidden Dangers.

The people of Vienna were thrown into quite a state of excitement soon after the terrible Bremerhaven affair, because a police agent, moved by that terrible catastrophe, had seized and thrown into the Danube three boxes of dynamite which were found in an exposed locality. These boxes, although plainly marked "Dynamite," had been lying in a public building about two years, without any thought of the dangerous character of their contents, un-til the officials were aroused by the announcement of the above mentioned catastrophe, when ment of the above mentioned catastrophe, when they were hurriedly placed in the hands of a police agent, with the advice that they be at once thrown into the river. This sage advice was quickly carried out; but as attention was drawn to the matter by certain lookers-on, it was suggested that the disposition made of the was suggested that the disposition made of the dangerous compound was not air gether a judicious one, since it placed in jeopardy every sailing craft on the river, as well as the entire city adjacent thereto. Another officer acting on this second thought promptly fished out two of the boxes, but the third eluded his search, and hence the scare lest the missing search, and hence the scare lest the missing box should suddenly reveal itself by the de-struction of some bridge pier or passing boat.

THE BRITISH COAL INDUSTRY.—The estimate of the amount of coal raised in Great Britain is 130,000,000 tons; of this amount less than 5,000,000 is exported. The loss of life by explosions and other mine accidents is about 1,050 per year, or one death for 106,000 tons of coal raised. These death statistics are collected and preserved, year after year, with much care and dreadful regularity, so that a collier's life may be pretty accurately calculated, seconding to the amount of coal raised.

How They Do It Henn.—A Frenchman who has lived in the United States for some years, says: "When they build a railroad in America, the first thing they do is to break ground. This done with great ceremony. Then they break the stockholders. That is done without cere-

GREMANY is going to send over here several floors of the mining department, with in-ractions to study up our mining industrice.

#### Cutting Steel With Soft Metal Discs.

Prof. B. S. Hedrick, of Washington, read a paper at the Detroit me-ting of the American Association for the Advancement of Science, explanatory of the mode and the essential character of the operation by which soft iron is made to cut hard steel. The development of heat by friction has been known for ages. A more recent discovery is that the operations of rolling and rubbing have the effect of changing the molecular structure of iron and steel Prof. B. S. Hedrick, of Washington, read by inclosing small quantities of the gas in air tight bags and allowing them to ascend into the upper regions of the atmosphere. Weights were attached to these bags to show the lifting power of the gas. Cavallo, the electrician, subsequently experimented in the same way in 1782. In 1783 the Montgolfier brothers, of Paris, repeated these experiments on a larger scale, and gave the first impulse to ballooning preparer. They attached a cart on halloon in giving out an immense cascade of sparks in the giving out an immense cascade of sparks in the operation. It was found on examining the observation. It was found on examining the debris beneath the disc that the particles of steel were not simply rubbed off. They were welded together in a pyramid like a stalaymite or the snow icicles formed on the top of Mount Washington. Prof. H-mrick ascertained that real fusion had taken place among the particles of steel. The disc is very little heated, but the steel is actually melted and drops down. Yet the bar on each side of the cut is not heated enough to draw the temper or ovivide the enough to draw the temper or oxizide the metal. Solid bars of steel of two inches or three inches in diameter are thus cut through in as many minutes. The soft metal disc is about 42 inches in diameter. The naked hand may be passed through the jet or stream of flying sparks during the operation without being burned, since the particles of melted metal are in the condition known as the spheroidal state.

#### Celluloid

Celluloid is the name given to a recently devised compound resembling ivory, and which is now used for making of billiard balls, hair brushes, for the manufacture of teeth, and in general, for almost any use to which avory may be put. This compound is said to be composed of gun-cotton, camphor and other ingredients of uncertain character. It is very innocent and attractive to the eye, but is made up of materials some of which at least we have learned to handle with much caution. The public have been led to believe, however, that when prepared for toilet and other use it is altogether free from danger. Perhaps it is so—so far as actual and violent explosion is concerned; nevertheless, it is asserted that celluloid will readily take fire, and burn with much violence, giving off large amounts of noxious gases, much They brought back from a hight of about 20. 1000 feet a sample of the air, which was care-that the surface, a matter, at the time, of considerable importance, as the uniformity of the atmosphere in the upper regions had been called in question.

In 1863, Nader attempted to take photographic maps while floating in the air, but failed. of thing we are either using, eating or drink-

New Explosives.—A new explosive compound has been introduced in Europe, and the name of "Vigorite" has been given it. It is formed of 25 to 50 per cent. of nitroline, nitrate of potash 15 to 25 per cent., chlorate of potash 10 to 30 per cent., and 15 to 35 per cent. of cellulose. Another explosive recently invented by Trutzschler Falkenstein, and apparently made of woody fiber prepared.

as would utterly forbid the entrance to the stomach of even the twentieth bird. But now stomach of even the twentieth bird. But now come a brace of Frenchmen from Louisville, Ky., who put to naught this saying by readily accompli-hing the feat; while one of the twain, after swallowing the thirtieth bird, smacked his lips and called for No. 31, which, with four others, was quickly dispatched, when nature rebelled against any further gormandizing.

THE FUTURE OF PETROLEUM.-Although pe THE FUTURE OF PETROLEUM.—Although petroleum is not iron, it is so closely connected with it that its ups and downs have a very marked effect upon certain forms of iron and its manufactures. Tubiog pipe, steel for tools, engines, boilers, pumps, tank iron, rivets, hoops, all enter largely into producing, refining and transporting carbon oil; in fact the consumption for this purpose demands the larger part produced of some classes mentioned. This fact gives the iron trade an interest in the future of this product.

VERY MINUTE ANIMALS.—When Lieutenant Berryman was sounding the Atlantic, prepara-Berryman was sounding the Atlantic, prepara-tory to laying the ocean cable, the quill at the end of the sounding-line brought up mud which, on being dried, became a powder so fine that on rubbing it between the thumb and finger it disappeared in the crevices of the skin. On placing this dust under the microscope, it was discovered to consist of millions of shells, each of which had a living animal.

DR. PETERMAN, the great German geographer, expresses himself satisfied that the diamond fields at Zimbaye, Africa, are identical with the Ophir of the Bible, from which King Solomon is said to have conveyed gold and ivory and precious stones for the construction of the temple. The place possesses ruins and extensive piles of buildings of unquestionably remote antiquity.

THE ACTION OF SALIVA.—M. Petit recently communicated to the Societe de Pharmacie of Paris the results of his experiments on saliva. He had found that one gramme of ptysline had the power of dissolving from 10,000 to 20,000 grams of starch, producing a quantity of sugar varying between 3,500 and 7,000 grams.

The cinnabar company on Applegate, Jackson county, Oregon, are now burning a large quantity of brick to use for their furnaces preparatory to commencing opporations on an extensive scale the coming summer.

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DOMESTIC PRODUCE.

of potash 15 to 25 per cent., chlorate of potash 10 to 30 per cent., and 15 to 35 per cent. of cellulose. Another explosive recently invented by Trutzschler Falkenstein, and apparently made of woody fiber prepared with nitro glycerine, has been recently tested in various mines in Upper Silesia. The results were on the whole not unfavorable, but the action was not always regular. The substance has not (as was at first claimed for it by the inventor) five times the force of an equal even four times was doubtful; but a three-fold force may be readily conceded. The advantages of the new agent are, less danger, as it does not explode on contact with open fire, and is but difficultly exploded by friction or concussion; and the fact that, to effect its explosion in a blast hole, the strand match may be used. The powder is very light, and in the loose state burns very slowly. A manufactory for the new agent has been established in Kieltsch. This explosive, it will be seen, is similar to giant powder—a vegetable fiber instead of a mineral powder—being employed as a carrier for the nitro-glycerine.

FEATING QUARIS.—It has often been said and printed that no person could eat a quail, each fair of the nitro-glycerine.

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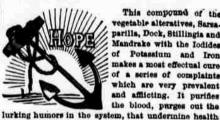
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