tris." On this passage, Dr. Ogle, the English editor of Kerner's work, remarks that a similar observation as to the habits of bees was made by Aristotle. "A bee," he says, "on any one expedition does not pass from one kind of plant to another, but confines itself to a single species, for instance to violets, and does not change until it has first returned to the hive.

Hybrid Fishes.—According to Mr. R. B. Roosevelt, the fish hatching Commission have raised hybrids between the following species of fishes: Salmon trout with whitefish; salmon trout with brook trout; brook trout with fresh water herring, with California salmon, and with the California mountain trout; shad with striped bass and herring. Of these crosses there are the young, now in the hatching house, of the salmon trout brook trout, brook trout California salmon, and brook trout California brook trout. It is observable of all hybrids that they are usually more shy and wild than either of their parents, and that in appearance they generally favor their larger parent. The cross between the brook trout and California salmon, and the salmon trout and brook trout bid fair to be fine fish. Those now in the hatchery are eight inches long. It is to be hoped that further careful experiments may be made to ascertain whether these hybrids are fertile and capable of producing fertile offspring.

The Mullein.—The common mullein, regarded as but a common coarse weed in this country, and so common in fields as to often prove a nuisance, is cultivated in England for its beauty. A writer in the *Gardeners' Chronicle* says that it "is well worth the attention of both amateur and professional gardeners." It seems that it is known in England by the common name of "Aaron's Rod." "There are two reasons," says this writer, "why it should be called by this name: first, the Romans dipped the stems in tallow, and burnt them at funerals. Secondly, the simple spike is long, cylindrical, and on it is a quantity of densely packed, very large, handsome golden-yellow flowers. The stem is five feet high. The flowers, when dried in the sun, give out a fatty matter, which is used in Alsace as a cataplasm in hemorrhoidal complaints. Formerly the plant was called barbascum, from *barba*, meaning a beard, an allusion either to the shaggy nature of its foliage, or else to two of the five stamens, which are hairy.

Private Patents.

Secret processes in manufacture are not uncommon now and here, notwithstanding the reasonable cost of a patent and the facilities for obtaining it. In England, where the cost and trouble of procuring a patent is much greater than here, these secret processes and receipts are very common, and the visitor to manufacturing establishments is frequently interdicted from a thorough exploration. The practice is a perfectly proper one, as an inventor as much owns the product of his brain and skill as the money he has earned; but there is always more or less risk attending the attempt to keep secret any profitable knowledge. If only one man possesses the secret, it is liable to be lost by his sudden death, to be possessed again only by a re-discovery. And although a certain prominent public lecturer may have attached undue importance to what he calls "the lost arts," it is undoubtedly true that there have been lost to the world really valuable facts in mechanics and chemistry and other arts and sciences by these attempts at secreting facts.

But there are patents in use which belie the term. Anything that is patent is "known" or "seen," the terms being synonymous. Yet there are methods of manufacture, compositions of materials, and machines for operation which have been patented and yet have never become known to the public. In some of these instances this withholding of public information is designed and intentional, the holders of the patents working it for their own profit, and believing that to be better for them than sharing it and receiving a royalty. It must be acknowledged that these are wiser than those who depend for their monopoly on their confidence in human nature—in human fealty—and run the risk of losing their advantage by death or unfaithfulness; for at the worst those who would share in the profits of the patented article may be compelled to pay fairly for it.

The number of these private patents which are held and used would surprise one who did not have good opportunities to ascertain the facts. And some of them are wonders of ingenuity and skill. One noted only a few days ago is a case in point. Among the productions of a busy concern recently inspected was that of drawer-knobs of wood. The extremely low price at which these knobs were sold was a surprise until the process of manufacture was witnessed; then it was apparent that the trifling price asked allowed a handsome margin for profit. A boy sat at a machine placing bored cubes of wood on a projecting pin that presented itself almost as fast as he could conveniently handle the blocks. Yet, every time he placed a block on the pin, a finished knob was thrown off, requiring only the insertion of a plug with which to secure the knob to the drawer, and varnishing to be ready to pack for the market. When the machine is prepared with the proper cutters it will turn almost any form of knob required, and being fed with the material in blocks it is absolutely automatic. "Only two of these machines were made," said the superintendent. "Where is the other?" was asked. "Out in the barn," was the answer. Here was a combination of self-acting tools that had been patented, and yet not used except in the concern where it originated, and so prolific was it in product that a second machine had been found unnecessary.

This is but a single instance of the use of an unknown though patented article. Some of the work done and some of the modes of work and action of these machines are very curious. It would quite astonish the reader if it was proper to describe the action of machinery seen in operation recently at a bolt-making concern. Some of the processes in the production of "bright goods"—those from stiff polished wire—practiced in certain concerns, and some of the operations in sheet metals, although patented, are unknown to "the trade" generally.

There is another class of unknown patents which are very like undeveloped mines of legally enjoined enterprises, of no profit to the owners and of no use to the world. Some of these patents lie useless because the holders have not the wisdom, energy, or money to push them. There are men who are keen enough to see the failures and note the shortcomings of others and cover their unprotected openings, yet who cannot understand their own advantage. They can invent and discover, perfect and improve, but they hardly know what to do with their creation or improvement. To be of any profit to them it should be made of use to others; but they neglect proper means of publicity, and eventually the invention or improvement is forgotten until some "live" man brings it out in different form, but perhaps no better shape, and claims the honors and reaps the profits. It is then, if ever, these slow coaches heave in sight. Then they begin to bluster about prior claims and prior discovery. But generally the enterprising reinventor takes all the honors, gives his own name to the invention, and gets the emoluments that attend on success.—*Boston Journal of Commerce.*

Submarine Topography.

The coast survey steamer Blake, Commander J. R. Bartlett, United States Navy, recently returned from a cruise taking soundings, serial temperatures, etc., in the course of the Gulf Stream, under instructions from C. P. Patterson, Superintendent of the Coast and Geodetic Survey, has brought some very interesting data in regard to the depths of the western portion of the Caribbean Sea. The depths and temperatures obtained last year in the "Windward Passage" between Cuba and St. Domingo were verified, and a few hauls of the dredge taken directly on the ridge in this passage. The data obtained render it very probable that a large portion of the supply for the Gulf Stream passes through this passage, and that the current extends in it to the depth of 800 fathoms. A few lines of soundings with serial temperatures were run from Jamaica to Honduras Bank, via Pedro and Rosalind Banks, and it was found that the temperature of 39½°, obtained at all depths below 700 fathoms in the Gulf of Mexico and the Western Caribbean, could not enter through this portion of the sea. But the temperature at the depth of 800 fathoms on the ridge in the "Windward Passage," between Cuba and Hayti, was found to agree with the normal temperature of the Caribbean and Gulf of Mexico, viz., 39½°. Soundings were taken between Hayti and Jamaica, developing a general depth between these islands not exceeding 800 fathoms, except where broken by a remarkably deep channel connecting the waters of the main Caribbean south of St. Domingo with those north of Jamaica. This channel runs close to Hayti with a greatest depth of 1,200 fathoms, and a general depth of 1,000 fathoms. Its course is northerly along the western end of Hayti, where it does not exceed a width of five or six miles; thence westerly, south of Navassa Island, with a tongue to the northward between Navassa and Formigas Bank, and another to the westward between Formigas Bank and Jamaica. A line of soundings was run from St. Iago de Cuba to the east end of Jamaica, where a depth of 3,000 fathoms was found twenty-five miles south of Cuba. This deep place was found by subsequent soundings to be the eastern end of an immense deep valley extending from between Cuba and Jamaica to the westward, south to the Cayman Islands, well up into the bay of Honduras. The Cayman Islands and the Misteriosa Bank were found to be summits of mountains belonging to a submarine extension (exceedingly steep on its southern slope) of the range running along the southeastern side of Cuba. This deep valley is quite narrow at its eastern end, but widens between the western end of Jamaica and Cape Cruz, where the soundings were 3,000 fathoms within fifteen miles of Cuba, and 2,800 fathoms within twenty-five miles of Jamaica. Near Grand Cayman the valley narrows again, but within twenty miles of this island a depth was found of 3,428 fathoms. The deep water was carried as far as a line between Misteriosa Bank and Swan Islands, with 3,010 fathoms within fifteen miles of the latter. On a line between Misteriosa Bank and Bonacca Island there was a general depth of 2,700 fathoms, and a depth of over 2,000 fathoms extended well into the Gulf of Honduras. Between Misteriosa Bank and Chinchorro Bank the soundings were regular at 2,500 fathoms. North of Misteriosa and Grand Cayman to the Isle of Pines and Cape St. Antonio the soundings were generally 2,500 fathoms. The serial temperatures agree, in relation to depth, with those obtained in the Gulf of Mexico by Lieutenant Commander Sigsbee, and in the Eastern Caribbean by Commander Bartlett; decreasing from the surface to 39½° at 700 fathoms or less, and constant at that temperature for all depths below 700 fathoms. At depths greater than 600 or 700 fathoms the bottom was always found to be calcareous ooze composed of pteropod shells with small particles of coral. These pteropod shells, as noted in previous expeditions by different nations, appear to be an important factor in the determination of the movements of great bodies of sea water. The ridge at the "Windward Passage" is bare coral rock, and on the south side the pteropod shells were found to be much more numerous than to the northward of the ridge.

Soundings and serial temperatures being the special objects of the cruise, dredgings were only incidentally attempted, for the purpose of reconnoitering, as it were, the ground; and it was found that the area passed over was not nearly so rich in animal life as that in which dredgings were made last year under the lee of the Windward Islands, at the eastward of the Caribbean Sea.

The development of the extraordinary submarine valley in the Western Caribbean Sea is a matter of great interest, considered as a physical feature. This valley extends in length 700 statute miles from between Jamaica and Cuba nearly to the head of the Bay of Honduras, with an average breadth of eighty miles. Curving around between Misteriosa Bank and Yucatan, and running along between Cuba and the ridge of the Caymans for a distance of 430 miles, with a breadth of 105 miles, it covers an area of over 85,000 square miles, having a depth nowhere less than 2,000 fathoms, except at two or three points (the summits of submarine mountains), with a greatest depth, twenty miles south of the Grand Cayman, of 3,428 fathoms; thus making the low island of Grand Cayman, scarcely twenty feet above the sea, the summit of a mountain 20,568 feet above the bottom of the submarine valley beside it—an altitude exceeding that of any mountain on the North American continent above the level of the sea, and giving an altitude to the highest summit of Blue Mountain, in Jamaica, above the bottom of the same valley, of nearly 29,000 feet—an altitude as great, probably, as that of the loftiest summit of the Himalayas above the level of the sea.

For the deepest portion of this great submarine valley, the Superintendent of the Coast and Geodetic Survey has adopted the name of "Bartlett Deep."—*N. Y. Herald.*

CAPT. DOBBINS'S SELF-RIGHTING LIFE BOAT.

Capt. D. P. Dobbins of the Life Saving Service reports the practical success of the life boat built on his plan, the construction and testing of which was provided for by Congress last spring. Capt. Dobbins reports as follows to Supt. Kimball:

"The self-righting surf boat authorized by letters of March 3 and 4, was completed and tested Thursday, June 17, by the keeper and crew of Life-Saving Station No. 6, under my personal supervision. The boat proves to be a perfect success. It will right instantly and carry her entire crew around with her when full of water as she is, on righting, and with her crew at their stations. She shows a side of over six inches out amidship, so she can be bailed readily. She is very stable or stiff under foot and in a seaway. It was quite difficult for the seven men to capsize her, full as much so as it is for the crew of the English self-bailing and righting life boats to capsize them. The prescribed beam of the boat made it difficult to secure the ready righting I claim for my own dimensions, but I have succeeded at the loss of a heavier boat than I designed for a practical surf boat. She will weigh not over 1,000 pounds, however, which is 600 pounds less than our ordinary surf boats weigh. She is roomy, stout, stanch, and strong, and pulls easily, and is a most beautiful sea boat."

This boat, which is not to be patented, dispenses with the heavy keel of the life boats now in use by the Service, and is "self-righting" by virtue of its model.

Walnut Timber from Arkansas.

The towboat Ida reached New Orleans, out of the Arkansas River, on June 8, with a walnut log raft of unusual proportions. Additional interest attaches itself to this raft on account of it being part of an order for 10,000,000 feet from a Bridgeport, Conn., sewing machine factory. The growing scarcity of this desirable wood in the Eastern States, and the demand by European furniture makers has developed distant sources of supply. The raft in question had been ninety days making the trip from the forests along the White and St. Francis rivers, in Arkansas, and in that time drift, five feet deep, had accumulated beneath the logs. Of these the raft contained 2,500, 2,000 being walnut and 500 cypress. The latter are used as buoys for the heavier timber. This log island measured 400 by 208 feet, and many of the walnut logs were over six feet in diameter. They were cut by a band of 200 Canadians who are adepts at working in hard timber, and can get out 500 logs per day under favorable circumstances. From New Orleans the logs go by rail to New England, this transportation being found to be just $2 per 1,000 less than by steamship. Col. S. M. Markel, of Missouri, has this contract, and has orders for walnut logs from Liverpool parties. The raft in question contained 600,000 feet, and is among the first shipments of the kind to the East.

A Sale of Fancy Cattle.

An important sale of short-horn cattle took place at Chicago the last day of June. The cattle were the property of Hon. M. H. Cochrane, of Compton, Canada, and Col. Le G. B. Cannon, of Burlington, Vermont. The Seventh and Eighth Duchesses of Hillhurst brought eight thousand dollars each. There were sold altogether thirty-two cows, averaging $995, and bringing in all $31,680. Eleven bulls were sold for $6,845, an average of $622.

The Sense of Smell.

The sense of smell is composed of two parts—a physical and nervous. The Schneiderian mucous membrane is the physical portion; the first pair of olfactory nerves constitutes the nervous portion. The Schneiderian mucous membrane (named in honor of Schneider, who first demonstrated that the nasal secretions came from racimose glands in this membrane, and not from the brain, as was formerly supposed) lines the entire nasal cavities. The olfactory portion, with which we have to deal in the study of the sense of smell, is easily distinguished from the rest of the nasal passages; in man, the sheep, and the calf, it is yellow; in most other mammalia it is of a brownish tinge: it is softer and thicker than other portions of the nasal mucous membrane. In man the epithelium of the olfactory membrane is covered with vibrating cilia, which are absent in most quadrupeds; this difference of structure probably is one cause of the inferior acuteness of the sense of smell in man. The olfactory membrane is limited by a tolerably well defined outline to the superior and middle turbinated bones and the upper part of the septum nasi. This portion only is capable of receiving odorous impressions.

The olfactory nerve or ganglia has three roots, the exact origins of which have not been definitely made out; the external root, which is of white matter, has been traced to the corpus striatum and optic thalamus, anterior commissure, and some fibers to the convolutions of the island of Reil. The middle or gray root arises from the caruncula mammillaris in the anterior lobe. The inner root of white matter arises from the inner and back part of the anterior lobe, and is probably connected with the gyrus fornicatus. These coalesce and run forward to the cribriform plate of the ethmoid bone, where there is a bulbous enlargement, from which are sent down the showers of filaments going to the olfactory mucous membrane. These filaments divide and subdivide, forming microscopic plexuses in the substance of the olfactory membrane, and appear to terminate between the fusiform cells of that membrane. The olfactory membrane also receives filaments from the nasal branch of the fifth pair of nerves, and is in direct communication with the spheno-palatine ganglion of the sympathetic. It seems probable that the sense of smell is due to the solution of the emanations from bodies in the fluid secreted by the racimose glands of the olfactory membrane, and in this condition coming in contact with the terminal filaments of the olfactory nerves produces a molecular change, either chemical or physiological, which change, when transmitted to the brain, gives rise to the sensation. As a general rule the longer the olfactory membrane is exposed to a particular odor the longer its effects continue; and in some cases it may be perceived for quite a while after the odoriferous substance has been removed. A person once having perceived a certain scent, will sometimes recognize the same odor (even though he may have forgotten it) without anything causing an idea of it, save perhaps an irritation of the ganglion.

This ganglion is situated, according to Ferrier, in the temporo-sphenoidal convolutions, and is by him regarded as the psychological center of the sense of smell.—*Medical Bulletin.*

The Eating of Clay.

Among the extraordinary passions for eating uncommon things, says Prof. Johnson (Chemistry Common Life), is to be reckoned that which some tribes of people exhibit for eating earth or clay. For instance, in Western Africa, the negroes of Guinea have been long known to eat a yellowish earth, there called *Caouac*, the flavor or taste of which is very agreeable to them, and which is said to cause them no inconvenience. Some addict themselves so excessively to the use of it, that it becomes to them a kind of necessity to their lives—as arsenic does to the Syrian peasants, or opium to the Theriaki—and no punishment is sufficient to restrain them from the practice of consuming it. When the Guinea negroes used in former times to be carried as slaves to the West India islands, they were observed to continue the custom of eating clay; but the *caouac* of the American islands, or the substance which the poor negroes attempted in their new homes to substitute for the African earth, was found to injure the health of the slaves who ate it. The practice was therefore long ago forbidden, and has now probably died out in the West Indies.

In Martinique a species of red earth or yellowish tufa was still secretly sold in the markets in 1751; but the use of it has probably ceased in the French colonies also. In Eastern Asia a similar practice of eating earth prevails in various places. In the island of Java, between Sourabaya and Samarang, Labillardiere saw small square reddish cakes of earth sold in the villages for the purpose of being eaten. These were found by Ehrenberg to consist for the most part of the remains of microscopic animals and plants, which had lived and been deposited in fresh water. In Runjeet Valley, in the Sikkim Himalaya, a red clay occurs, which the natives chew as a cure for the goiter. The chemical nature of the substance has not been examined. In Northern Europe, especially in the remote parts of Sweden, a kind of earth known by the name of bread meal, is consumed in hundreds of cartloads, it is said, every year. In Finland a similar earth is commonly mixed with the bread. In both these cases the earth employed consists for the most part of the empty shells of minute infusorial animalcules, in which there cannot exist any ordinary nourishment. In North Germany, also, on various occasions, where famine or necessity urged it, a similar substance, under the name of mountain meal, has been used as a means of staying hunger. In South America, likewise, the eating of clay prevails among the native Indians on the banks of the Orinoco, and on the mountains of Bolivia and Peru. Humboldt states that the earth eaten by the Otomac Indians, on the Orinoco, is an unctuous, almost tasteless clay—true potter's earth—having a yellow-gray color, in consequence of the presence of oxide of iron. This they select with great care, and they are even able to distinguish the flavor of one kind of earth from that of another. At the periodical swelling of the river, which lasts from two to three months, and when all fishing is stopped, they devour immense quantities of earth. An Indian will eat from one-quarter of a pound to one pound and a quarter of this food daily. A similar practice prevails in the hill country of Bolivia and Peru. Dr. Weddell saw a species of gray colored clay exposed for sale in the markets of La Paz, on the Eastern Cordilleras, and which was called by the native name of *Pahsa*. The Indians, who are the only consumers of it, eat it in large quantities with the bitter potato of the country. They allow it to steep for a certain time in water, so as to form a kind of soup or gruel, and season it with salt. At Chiquisaca, the capital of the State, small pots made of an earth called *Chaco* are exposed for sale. These are eaten like chocolate. The eating of certain varieties of earth or clay may therefore be regarded as a very extended practice among native inhabitants of tropical regions of the globe. It serves, in some unknown way, to stay or allay hunger, stilling, probably, the pain or craving to which want of food gives rise. It enables the body to be sustained in comparative strength with smaller supplies of ordinary aliment than are usually necessary; and it can be eaten in moderate quantities, even for a length of time, without any sensible evil consequences. A fondness even is often acquired, so that at last it comes to be regarded and eaten as a dainty.

Botanical Notes.

Influence of Light on Size of Leaves.—M. Ch. Flahault, in the *Annales des Sciences*, brings forward additional observations to support his view that under equal conditions, the leaves of plants of the same species are larger in proportion as we go northwards, these relatively larger dimensions being due to the duration of light of relatively feeble intensity. In cases where the chlorophyl is formed in the absence of light it must be formed at the expense of the materials stored up in the tissues. The importance of these reservoirs of nutriment is still greater in the case of flowers. Thus, in the case of hyacinths, both blue and red. M. Flahault found no difference in the color of the flowers grown in the light or in the dark, the color being manufactured from the stores of material in the bulbs.

A Wonderful Tree.—Baron Ferd. Von Mueller says in his "Eucalyptographia," that one of the grandest trees of the globe, and one of the greatest wonders in the whole creation of plants, is the *Eucalyptus diversicolor*. Astounding records of the height of this tree have been given. The Messrs. Muir saw trees with stems 300 feet high up to the first branch, and Baron Von Mueller himself noticed many which approached to 400 feet in their total height. When closely growing the young trees may have a comparatively slender trunk, so much so that a tree 180 feet high may show a stem hardly more than a foot in diameter. In such a case the foliage, for want of space, is also only scantily developed, and the ramifications are but short in proportion to the tallness of the stems. In the mast-like straightness of the trunk and the smooth whiteness of its bark, this superb tree imitates completely the variety *regnans* of *E. amygdalina*, of Southeast Australia, with which also, and perhaps solely, it enters into rivalry as the tallest tree of the globe. Even the loftiest trees may not have been found out yet in the secluded humid forest valleys, in which *E. diversicolor*, like *E. amygdalina*, rejoices most and luxuriates to the greatest extent. But possibly in the 200 miles of uninterrupted length of *Sequoia* forests, a few years ago rendered known to exist in Southern California, mammoth trees of *Sequoia Wellingtonia* or *S. sempervirens* may occur, which possibly excel in stupendous height even the famous individual trees of the Calaveras grove.

Big Trees of the West.—Case's "Botanical Index" gives the following record of some large trees growing in Indiana: *Chestnut.*—In Jackson County there are to be found the largest chestnut trees in the State. They are veritable giants, located about three miles southeast of Seymour. One of these measures 23 feet in circumference 2 feet above the ground, and the height to the first limb is 70 feet. *Sassafras.*—This tree attains a remarkable size on the Lower Wabash. One of these, one mile and a half west of Springfield, is fully 3 feet in diameter, and for more than 60 feet clear of limbs and knots. Its height in full is 85 feet. *Catalpa.*—In this same region and along the Wabash the catalpa grows slender and tall, and in great abundance. It is used for both fence rails and posts, and for durability stands next to the black locust. *Sycamore.*—The giant tree of Indiana, in all probability, is a sycamore in the White River bottom, not far from Worthington. It is said to be 48 feet in circumference, and has a solid trunk. At a height of 25 feet it branches into three or four limbs, one of which must be more than 5 feet in diameter. The tree is not quite round, but still it is quite regular.

Botanical Gardens.—A paper on the botanical enterprises of the empire was read, May 11, to the Colonial Institute by Mr. Thiselton Dyer, Assistant Director of Kew Gardens. The lecturer gave a history of botanical gardens, which date from the middle of the sixteenth century, when Alfonso d'Este, Duke of Ferrara, the patron of Tasso, set the fashion of making collections of foreign plants and flowers. The earliest public botanic garden was founded by Cosmo de' Medici, in 1544, for the University of Pisa. The following year one was founded at Padua. In France, the earliest botanic garden was founded at Montpellier toward the end of the sixteenth century; and in Germany, that of Giessen was established in 1614; and in the Low Countries, that of Leyden dated from 1577. In England the Royal Garden at Hampton Court was founded by Queen Elizabeth, and supported by Charles II. and George III. Those which followed and still remain were: Oxford, founded in 1632; Chelsea, in 1673; and Edinburgh, in 1680. The origin of Kew as a scientific institution was entirely due to the Hanoverian princes. During the reigns of George IV. and William IV. Kew was much neglected; but since that date, owing to the efforts of Lindley and Hooker, this state of things has been remedied. Plant distribution to all parts of the world is extensively carried out from the gardens, especially that of cinchona, caoutchouc, and Liberian coffee. The herbarium is the largest in the world. The example of Kew in the matter of museums and economic botany has been followed by Hamburg, Berlin, Ghent, Paris, Boston, and the English colonies. Recently the whole vegetable collections of the India Museum have been transferred to Kew. Mr. Dyer stated that one of the most striking features of the gardens was the enormous correspondence with the botanic establishments of the colonies.

An Interesting Botanical Fact has been discovered by M. Lemoine, of Nancy, who finds that the stigmas of double flowers are capable of fertilization by the pollen of single flowers, with the result of yielding seeds which in the majority of cases produce double flowers.

Setting Type by Telephone.

The London *Times* contains an article describing the system of telephonic reporting adopted by that journal, in order to have the latest and fullest report of the speeches made in the Houses of Parliament. Permission having been obtained from the Metropolitan Board of Works to lay down the necessary wires in the subway of the Embankment, a new connection between the House of Commons and the *Times* office was formed, and one of Edison's loud-speaking telephones placed at either end. The immediate result of this arrangement has been to bring the compositor at the machine into direct communication with the Parliamentary reporter at the House, and to enable the debates to be reported and printed from half to three-quarters of an hour later than had previously been possible. The notes made by the reporter can be read directly into the telephone receiver in a room adjoining the gallery either by the reporter himself when relieved or by another person employed for the purpose; and the compositor, at his machine in the office, sits with his ears in juxtaposition with the other terminal of the instrument. The plan which has been found the most efficacious for the purpose of shutting out distracting sounds of other kinds is to place the disk of the telephone above and behind the compositor, and then to arrange two tubes, each with two trumpet-shaped extremities, in such a manner that these extremities are applied at one end to the two sides of the telephone disk and at the other end to the two ears of the compositor. The compositor is also furnished with a speaking instrument, with a key for ringing a bell, and with a bell which is rung from the House, a simple code of bell signals, consisting of one, two, or three strokes, sufficing for the ordinary requirements of each message. The compositor announces by the bell that he is ready, receives a sentence, strikes the bell to indicate that he understands it, sets up the type with his machine, strikes the bell again for the reader to continue his dictation, and so on until the work is carried as far as time will allow. If there is any doubt or difficulty about the words, a bell signal will cause them to be repeated, or explanations can be sought and received by direct vocal communication. In this power, indeed, resides one of the chief advantages of the method, and one which ought to lead to greater accuracy than has ever previously been attainable. The names of people, places, etc., can be spelled out letter by letter if there is any doubt about them.

Ice Gorge at Newton, N. J.

An interesting ravine, in which natural ice remains throughout the summer, is attracting local interest at Newton, New Jersey. It lies at the foot of Blue Mountain, is several hundred yards long, from ten to thirty feet deep, with caves and clefts in the rocks, filled with ice. The shade at the gorge is described as very dense, the sun apparently never penetrating it. The bottom of the gorge is covered with ice, and the little caves and crevices are filled with it. The parapet of the mountain, like the Palisades of the Hudson, is very nearly perpendicular, and rises about 400 feet above the ravine, through which a current of cold air sweeps constantly. The thermometer, which registered in the nineties in Newton, marked 38° at the bottom of this gorge—too cold for one to remain there any length of time. A few feet from one end of the gorge a spring of the most delicious sparkling water bubbles up. It tastes slightly of iron, and is very satisfying to the thirst. The water in this spring stands at 34°. The owner of the farm on which the gorge is found, says that it is much resorted to for ice, so that by the middle of August but little remains except in the caves and deeper holes.

On the Advantages of Moistening the Air in Cotton Mills.

Considering the immense expenditure of brains and money during the last forty years by inventors, machinists, and manufacturers, in perfecting machinery used in the several processes of cotton manufacturing, one might be led to suppose that a mill, equipped with modern machinery such as is turned out by the best makers, would always produce goods of uniform weight and quality. Experience, however, shows that at almost any time there may be found in such mills a variation of from one to five or more numbers in the yarn, and from one to three per cent in the weight of cloth, and sometimes the same or more in width, and a quality far from perfect, although the average weight may be at or near the standard by taking a month's work together. Carding and spinning overseers regularly weigh roving and yarn several times a day, and alter gears if need be; yet with all this care and watchfulness they are not able to prevent the variations noted, although there has been no change either in cotton or in the general operations of the machinery.

In the light of present knowledge it is unreasonable for manufacturers to expect or require machine builders to make machinery that will produce uniform and exact results at all times, so long as no means are taken to produce a uniformity of atmospheric condition in which to operate the machinery. This has reference to variations of climate, and to electricity and dryness. Frictional electricity is generated by the motion of wind, belts, pulleys, fliers, bands, cylinders, beaters, etc.; also by the friction of rolls, bearings, etc. Its effects upon the cotton fiber are to cause it to cling to beaters, cylinders, and cylinder aprons, and to puff up the sliver, so that when it passes through the evener trumpet it delivers less actual fiber than intended, and less than it would if there was an absence of electricity, thus not only making variable sized yarn and cloth (as the electricity varies), but causing the work to run badly in the subsequent operations, which are set and calculated for a specific size of roving or sliver. In doubling and drawing there is a constant loss and damage to the sliver occasioned by electricity, which causes the fibers to stand out and catch on to and lap round the rolls. The electrical condition of the air varies much, and we have so little knowledge about it, and so few means of measuring it, that it is almost impossible to tell when and how much to alter machinery to correct its effects. Some means are needed in every department of a mill to absorb or destroy this disturbing element. Now it would seem that a remedy exists in moistening the air, thereby rendering it capable of conducting away the electricity as fast as it is produced.

A short time since, a well known and skillful American manufacturer had new cards of English make, which, when started, would take in cotton well enough, but the combs would not take it off the doffers until he had pails of water set all around the cards, and had watered the surroundings. The trouble was too much electricity, and carders often have similar experience with common cards, especially in dry and windy weather. We must always remember that dry air is a poor conductor of electricity. On the other hand, too dry air in some respects affects the running of the work in a cotton mill in much the same way as electricity, especially as regards the puffing-up of the sliver. Dry air absorbs the moisture from oil placed on bearings, thus depriving it of an important element of lubrication. Every band that drives a spindle ought to be, and is supposed to be, put on with just the amount of tension needed to run it properly. If the air at the time is dry, and changes to damp, then the band will be too tight, requiring more power to drive it, and more oil to lubricate it; while, on the other hand, if the air were damp and changed to dry, the band would become loose, and would not drive spindle to speed, and hence would make slack-twisted, poor yarn. It is well known that carding and spinning as well as weaving runs better in damp air; moisture gives elasticity to yarn. In weaving, warp threads are sized or starched to prevent their being roughed up by the action of the reed and harness, but the reed and harness will rough up and rub off much fiber and starch unless the air is moist enough to keep them in place. The sudden blows of the lathe in driving in the filling strains the yarn severely; so, unless there is some elasticity in the yarn, it is very liable to break, and of course causes imperfect work and loss of production. It is a common practice among weavers to moisten the yarn by placing a wetted cloth over the warp beam, especially if the warp be hard-sized. Most manufacturers now acknowledge the need of regular moisture, and some vainly try to obtain it in weaving rooms by blowing off raw steam, which usually gives much heat, but little water to dampen the air with.

In our climate, when it is dry weather, the air contains one or two grains of moisture to the cubic foot of air, and when damp, from five to twelve grains of water to the cubic foot of air, each depending upon the temperature. It is not claimed that a proper regular humidity will remedy the defects of machinery, but it is claimed that it will absorb electricity, or destroy its power to injure the proper manipulation of cotton, as well as give the most desirable condition in which to produce the best goods at the chapest cost.—*The Universal Engineer.*

Crystallized Prussian Blue.

To the various forms of Prnssian blue already known, such as soluble, insoluble, etc., we may now add a crystalline form. Prof. Gintl, in Prague, says that when freshly precipitated Prussian blue is treated with a slight excess of concentrated hydrochloric acid and gently warmed, it will dissolve. A larger excess of acid will dissolve it cold. The resulting solution has a faint yellow color, and when diluted with water the blue pigment again separates. If the solution be allowed to evaporate spontaneously at ordinary temperature, or is slowly diluted by the absorption of moisture from the atmosphere, the Prussian blue will separate as a crystalline sediment, which possesses a magnificent copper luster in reflected light, and hence a glass surface covered with a thin layer of this sediment looks like a copper mirror. When magnified somewhat this sediment is seen to consist of individual crystals, which have an intense blue color in transmitted light, but seen in reflected light glisten with a fine copper red.

In every position the crystals present quadratic faces to the observer, and being perfectly indifferent to polarized light, we must conclude that they belong to the regular, or isometric system, although the crystals were too small to be measured. Gintl did not obtain crystals large enough to permit of an accurate determination of the crystalline form, hardness, and specific gravity, but, if the experiment were carried out on a larger scale, and by conducting the evaporation or dilution very slowly, probably larger crystals will be obtained.

It is also of interest to know that what is called Turnbull's blue, formed by precipitating a ferrous solution with ferridcyanide of potassium, reacts in the same manner when treated with hydrochloric acid, and similar crystals separate. This fact favors the theory previously advanced that Prussian blue and Turnbull's blue are perfectly identical compounds. If a solution of oxide of iron containing an excess of hydrochloric acid be mixed with a solution of ferrocyanide of potassium, also containing hydrochloric acid, no precipitate is formed until diluted. With ferrous oxide and ferridcyanide, both containing hydrochloric acid, a pale yellow solution also results. In this solution sulphocyanides produce a red color, showing that the iron has been oxidized at the expense of the ferridcyanide, and then it unites with the ferrocyanide formed. This favors the identity of Turnbull's blue and Prussian blue.

What Constitutes a Conspiracy?

The preliminary contest in the St. Louis courts in the conspiracy suits of the Vulcan Steel Works against their workmen has been decided in favor of the company. The case is a somewhat peculiar one. James Tighe, Dennis Griffin, Michael Dimon, Martin Hanifin, Bart Fenton, Patrick Reiley, and Martin Hooley were employes in the converting department of the Vulcan Works. On the evening of the 5th of last April, when two heats of iron were partially melted, the cupola ladle filled with molten metal and the pits covered with cooling ingots, these men are charged with conspiring together and suddenly going out upon a strike for higher wages. This placed the Vulcan superintendents in a predicament, and they allege that, were it not for the timely arrival of a sufficient force of men at the works just at the proper time, the metal would have become hardened in the receptacles, causing the works to lie idle and putting them to a great deal of expense in placing them in working condition again. With the assistance of the new workmen they succeeded in escaping actual loss. The arrest of the parties named followed for conspiracy. Their attorney moved to quash the proceedings on the ground that they had committed no offense under the common law. The acting State attorney claimed that it was both a statutory and common law offense. The case was finally argued before Judge Cady, who delivered, at the session of the Court of Criminal Correction, the appended decision: "The statement contained in the information filed in this case, if true, constitutes, in my opinion, a clear case of conspiracy. It is doubtless true that there is no crime in the solitary fact that the several defendants agreed or conspired together that unless higher wages were paid they would cease work, but it is equally clear that for these defendants to confederate, conspire, and agree together to stop work under the circumstances and for the purposes alleged in the information, is an offense. It is true that the mere failure or a refusal to perform a civil contract is not of itself a crime. But the circumstances alleged in connection with the refusal of these defendants and others certainly constitute an offense. I am, therefore, of the opinion that the motion should be overruled and the defendants put upon their trial."—*Coal Trade Journal.*

Labor-Saving Machinery.

The *Shoe and Leather Reporter* thus sums up the labor-saving appliances which have been introduced into the boot and shoe manufacture within a few years:

To enter into a detailed description, remarks the editor, of these labor-saving devices would be an almost endless task, but a general idea can be gained from the following: Among the latest inventions is the hydraulic shoe press, with which one operator can sole 700 pairs of shoes per day. Next comes the beating-out machine, which is a most necessary adjunct to a large shoe factory. Then come several designs in power machines for trimming and planing the edges of soles of shoes, each doing the work of three men, and better than by hand. Next comes the sewing-welt, or turn machine, making a shoe as pliable and comfortable as one hand sewed, and it is hard to detect any difference, one machine being capable of making 120 pairs per day. Again, there is produced a lasting machine, whose work is simply perfect and wonderful. Then we have a new welt shoe machine, or aid to hand sewing, which pricks the holes and trims the sole, ready for the workman to simply put in the stitches, making the boot or shoe a hand sewed shoe in every essential particular. Then the numerous wax and dry thread sewing machines come in, adopted for every variety of work, from the finest French kid or velvet embroidered slipper to the closing up of the seams of the heaviest stoga boot or brogan. Again, we have a patent vamp folding machine, which neatly and rapidly turns the edge of the vamp, leaving a neat and finished appearance, instead of a raw edge; heel-scouring and sand-papering machines are made in every variety; stamping machines for monograms on the soles, heel trimmers, and an endless variety of small but useful machines; peg cutting and nail rasping machines, that will clean the pegs and nails out of a shoe from heel to toe, from a child's shoe to a heavy boot, leaving the inside perfectly smooth, which do not disturb the crimp or injure the upper in the least.

Then we have the boot and shoe crimping machine, two entirely separate inventions, the boot crimper being capable of perfectly crimping 12 to 16 cases of boots daily, and better than can be crimped by hand, and the shoe crimper that can finish in a perfect manner over 400 pairs per hour. In leather machinery we have glassing, stoning, pebbling, and polishing jacks, tanning and stuffing mills; hide unhairing machines that will do the work of 4 to 8 men, taking out the lime, doing away with the objectionable bating or drenching, and doing 800 sides daily with ease. Then we have the wonderful scouring or hide machine, that marvel of skill and ingenuity; union and belt knife splitting machines; bark mills, capable of grinding many cords of bark, wet or dry, daily; tan presses that will press perfectly one cord of bark per hour, and leave it so free from water that it can be immediately used for fuel; the wonderful leather measuring machine, for giving positive and instantaneous measurement of skins or leather. Then there is a new machine for softening leather, by which every fiber is loosened and softened without injury, leaving the leather strong, soft, and flexible, besides hundreds of other machines which are now being perfected. Our boot and shoe manufacturers are enterprising, and are always ready to adopt any new thing that has actual merit, and the shoe factories of to-day present a marked contrast with those of former years.

Yield of Butter from Cream.

I have, for some time past, kept accurate account of the quantity of cream put into the churn and the butter taken out, and I find that one quart of pure cream, weighing precisely two pounds, will make one pound of butter, as near as can be figured. This is the thick cream, which is taken in an adherent, leathery skin from a shallow pan in which the milk is three inches deep, and has been kept until it is sour, but not thick. From cream taken from a pail eighteen inches deep, and which stood four inches deep on the milk, but which was semi-fluid, three pounds of butter was given by four quarts of the cream. This cream was in good condition for churning, and needed no water to dilute it. It was distinctly sour, having been skimmed from milk set thirty-six hours, and was kept forty-eight hours before churning. The churning was sixteen quarts, which yielded twelve and one-half pounds; the temperature of the cream was sixty-two degrees, and the time of churning was eleven minutes. The cows were Jersey and Ayrshire. The more solid cream was all from Jersey milk, was in the same condition as the other as to sourness; twelve quarts were put into the churn, and eleven pounds fourteen ounces of butter came out; the cream was too thick to churn without considerable water being put in. The temperature of this churning was sixty-five degrees, and the time eight minutes. There is no doubt that sour cream will make better flavored and more solid butter, and more of it, than sweet cream; the butter will also keep longer in good condition. Sweet cream butter is excellent, and may be exquisite, if very well made, for immediate use, but it deteriorates very rapidly, while sour milk butter improves by keeping for several weeks, if well made and well kept. But neither the milk nor the cream should be permitted to turn to "clabber," as Mr. Bonner terms it.—*H. Stewart, in Country Gentleman.*

Rome to have an Exhibition.

It is proposed to have an International Exhibition in Rome in 1885-86, and a journal has been started to further the project. An effort is being made to secure for the Exhibition outside Porta Pia and Porta Salara, on the north side of Rome, embracing the Villa Albani, with its fine collection of sculpture and Italian garden; the Villa Borghese, with its pleasant walks and gallery; the Villa Ludovisi, adjoining the walls, with its casino, and the Aurora of Domenichino; the Villa Patrizi; the Villa Torlonia; the Villa Ada—lately the king's property, but since bought by Count Telfener—which reaches to the edge of the Anio; and the tract lying between these estates, from the furthest of which the land drops suddenly down to the Campagna, giving a splendid view of Soracte and the Sabine Hills.

A New Breed of Whales.

A whaling captain, lately returned from the Arctic seas, declares that a new breed of whales have made their appearance in those waters. They are supposed to have emigrated from the open sea at the pole. The skipper describes them as very much larger than the old whales, and very gentle and confiding. In former years when a whale was harpooned the rest of the herd threw up their flukes and made off. The new breed do not seem to mind in the least the capture of one of their number.—*N. Y. Evening Post.*