

who, on the 16th of December last, gave an exhibition of his machine, its powers being exerted on blocks of the hard Quincy granite. The principal part of Mr. Shelbourne's machine is a cast iron casing, in form a depressed semi-spheroid, or shallow inverted bowl, seven feet in diameter. It has three solid steel feet or toes by which its stability on the rock is secured. Rising from the upper part of the casting is a conical wrought iron frame, supporting the upper end of the drill shaft by means of two parallel rods entering into sockets in a cast ring at the top of the frame. The drill bar passing up through the centre of the top is furnished at the bottom with a bit, one and a half inches diameter, and having imbedded in its face nineteen diamonds, and rotating at the rate of from 300 to 500 revolutions per minute, advancing at the rate of from one to one and a half inches in the same time.

The feed is caused by a differential gearing which steadily operates to advance the drill into the rock, the debris being washed away by the water forced into contact with the bit through a small rubber hose. The water-tight chamber of the machine contains a pair of engines working at right angles to each other, with a horizontal stroke. As soon as the hole is completely drilled, and also when the drill-shaft is withdrawn from the rock, information of this is given by a magnetic bell which is acted upon by a double wire cord insulated from the water and passing down one of the parallel rods or tubs upon which the crosshead is fixed.

This drill weighs nearly five tons. It will be worked from a wrecking tug with a derrick by means of steam supplied from the boiler of the tug. To prevent this steam being condensed in its passage through the water to the engine it is conveyed in a hose surrounded by another through which the exhausted steam passes.

The rock which will be drilled in the Hell Gate is that known as the bastard granite, and is much softer than either the Quincy or Maine granite, on which the drill has been satisfactorily tested. After a number of holes are drilled over a certain space, a diver will descend and charge them with cartridges of nitro-glycerin, which will be exploded in the usual manner. In connection with the drill another very ingenious and automatic machine will be used to grapple and raise the fragments.

#### CONCEPTIONS OF THE INFINITE.

Try all we may, we fail to get even the most dim conception of the absolutely infinite—that which has no bound, no measure of comparison. We will cease to make any effort to conceive it as soon as we realize the fact that all our ideas are comparative. Size, color, form, weight, all the qualities in which material things differ from each other, are all judged by comparison with something else. A unit of comparison which answers well as a measure of some object or distance, may be found to be inadequate for the measure of a larger object or distance. To estimate the distances of very remote objects, as the fixed stars, it becomes necessary to take a very large unit of comparison, say the distance light travels in a single second.

Thus it has been estimated that Sirius the "dogstar" is at such a distance from the earth that light requires fourteen years to travel from it to our earth. When we reflect that light travels at the rate of 190,000 miles in a second, we can form a conception of this distance which would be impossible if we made a mile the unit of measurement. But this distance, large as it is, is rapidly increasing. It has been recently computed that Sirius is moving away from the earth at the rate of 144,000 miles per hour. The method by which this motion has been determined leaves no room for doubt as to its reality although it may well be doubted that the rate of recession is anything more than a rough approximation.

These illustrations, although they do not disprove the statement that the human mind cannot conceive infinity, show that the nearest approach to such a conception is in the study of that sublime science, astronomy. No wonder that the devotees of astronomy are the most laborious of all the divisions of the grand army of science. No wonder that they who nightly gaze upon the mightiest of God's works, should have ever been the most unwilling to doubt the existence of a higher creative intelligence. No wonder that this grand study has attracted to itself and appropriated the best talent of every age, and that those who "nightly assault the heavens with the artillery of science," are humbled with the sense of their own weakness as they contemplate the stupendous machinery of the universe.

#### WHAT IS SCIENCE?

The primary signification of the word science is knowledge; but as generally accepted it means knowledge reduced to a system. All knowledge is comprised of facts and logical inferences from facts. The basis of all science then is fact, and the prime object to which all scientific research should be directed is the determination of facts. Facts, being the foundation upon which the logical superstructure must be reared, are of the most vital importance. They may not be assumed; all guesswork is to be strictly shunned.

People are too apt to forget that it is quite possible to reason correctly and ably upon totally false premises. The world is full of books that exemplify our proposition. Old libraries are filled with quaint and labored expositions of almost every subject upon which men can think, valueless now, because they have been found to conflict with facts. It is with feelings of admiration that we roam through a collection of these almost forgotten labors—admiration for the talents which in the light of the nineteenth century, would have made a brilliant display, and which, even in the darkness of medieval times, made a manly and brave struggle to reach truth.

We pride ourselves upon the progress of the times, and we

have good reason to do so; at the same time it is not by any means improbable, that many of our views upon subjects relating to the sciences will be discovered to be fallacious by a future generation, as those of a past age have been by us. It seems to us that there is too much inquiry as to *why* things are and too little as to *how* they are. What is of practical value is how things occur—what are the invariable laws that govern their occurrence. Had Newton set himself to speculating as to why gravitation takes place, rather than to the investigation of the laws which govern the attraction of masses to each other, his labors upon that subject would have been altogether vain and worthless. But his was a mind that applied itself to the investigation of facts. It is true he hazarded some hypotheses, but they were only entertained by him as being what might ultimately be demonstrated by experiment to be true, not made the basis of system. The world has had too much theorizing and is now getting down to the true foundation, the veritable hardpan of all science facts.

#### REMINISCENCES OF TRAVEL IN SPAIN.

NO. III.

DUICAL PALACES—THE ESCORIAL OF PHILIP THE SECOND. The public buildings of Madrid are unusually good, and there are many grand ducal palaces fitted and furnished in sumptuous style, the most interesting of which are those of the celebrated Duke of Alva, and Cardinal Ximenes, the latter in some respects the ablest man which Spain has ever produced. Ximenes began his career by entering a Franciscan monastery. During the reign of Ferdinand and Isabella, over whom he exercised a strong influence, his mind more than any other, controlled the policy of the kingdom, and to this day his memory is revered as a saint. The gloomy old palace is a fitting reflex of the rigorous habits of the Cardinal. The palace of the Duke of Medina Celi, facing the Prado, covers an area of 245,000 square feet, and is fitted up with all that taste, skill, and love of display which characterize the wealthy classes of Spain. The Marquis of Salamanca has two elegant palaces; and until recently his picture gallery was looked upon as containing one of the finest private collections in Europe. Some of our readers will remember the Marquis as having been an active promoter of the Atlantic and Great Western Railway; and the town of Salamanca, Pa., was named after him. It is reported that he lost heavily by his railway schemes, and that in order to repair the drain made upon his fortunes, he had sold at the recent Paris exhibition many of his valuable pictures, from which he realized upwards of three hundred thousand dollars.

Wealth in Spain, as in most monarchical countries, is very unequally distributed. The grandees are usually very rich in landed estates and other property, while the poor are very poor. In point of squalid poverty, the streets of Madrid are full of picturesque effects. Vice and immorality run through all classes of society, and yield their bitter fruits. The more common outward vice of the lower classes consists in their passion for bull-fights, cock-fights, and lotteries. It is a common thing to witness upon the streets, old men, women, and young children hawking about lottery tickets, from the sale of which they gain a miserable pittance.

Spanish history abounds in great mysterious characters, and we are obliged to confess that there was something strangely fascinating connected with our trip through that romantic country, which we can only explain by the fact that in early life we had read with interest "Don Quixote," Prescott's histories of "Ferdinand and Isabella," "Charles the Fifth," and "Philip the Second," also Irving's "Conquest of Grenada" and the "Tales of the Alhambra." The reader can therefore readily imagine with what eagerness we sought out the Audiencia where Ferdinand and Isabella were married; the old palace where Philip the Second was born; the little chapel at Seville, where Columbus met Isabella on his return from San Salvador; the house where he died, and the parochial church where his funeral obsequies were celebrated, also the many exquisite edifices left by the exiled Moors. Perhaps, however, there is no single pile of architecture remaining in Spain so interesting as the Escorial—about two hours' ride by railway from Madrid, and regarded by the Spaniards as the eighth marvel of the world. The Escorial was designed and built by Philip the Second, a cold, haughty, intellectual bigot, who, after burying one youthful queen, went over to England and married "Bloody Mary." Philip does not appear to have been greatly afflicted when Mary died, for history represents him so very anxious to obtain another queen that he could scarcely wait for the six months' official mourning to cease before he sent his ambassador to claim the hand of Elizabeth of Valois, daughter of Catherine de Medicis, then in her sixteenth year, and knowing all the while that his unfortunate son, Don Carlos, had a strong passion for the beautiful princess.

History says that Philip was induced to found the Escorial as an act of gratitude to God, and especially to his patron, St. Lawrence, who inspired the victory of St. Quintin, in 1557. The buildings, which comprise a palace, temple, and monastery, cover 500,000 feet, and cost upwards of four millions of dollars in those times, when it is said that the laborers received but six cents per day for their work. The situation of the Escorial, under the shadow of the Guadarama mountains, is desolate and melancholy in the extreme. The mountains are one mass of bare gray granite, and the wide sweep of country lying in front is a monotony of rocks and stunted trees. Philip was two years in hunting out this situation, and if he had searched for two years more he could scarcely have made a selection more desolate. St. Lawrence suffered martyrdom by being roasted upon a gridiron, and it is thought that Philip had the form of that instrument in his head when he drew the plan, which no doubt was supplemented by a granite boulder in his hat, if one may judge from the immense piles of stone blocks employed in its construction.

The architecture of the Escorial is severely simple, grand and gloomy. Philip built it not for a prince, but for a monk, and wanted for himself only a cell, where he could live and die, in the palace he had built to God; and certainly, we never before saw so much simplicity and solidity in any other similar structure. The palace was originally very plainly fitted up. Philip's cheerless cell, where he was accustomed to pass a good deal of his time, had four common-looking pictures hung upon the walls, a plain board table, a single chair, and a stool upon which he used to rest his gouty foot, the sacking still showing the stains from the remedies employed to kill the pain. These relics of the monarch are reverently shown, and attest the rigid austerities practiced by him after his retirement to the Escorial.

The treasures of the Escorial are very numerous. There are many fine paintings, statues, and tapestries, curious pieces of furniture, elegant and costly church vestments, beside several thousand saintly relics, highly venerated, among which are ten complete skeletons, more than a hundred heads, and several hundred bones. Philip had a passion for these things.

Just back of the choir of the temple, there is suspended a marble crucifix of life size, done by that famous man Benvenuto Cellini of Florence. He worked upon it, he says, "with the diligence, and love, that so precious an object deserves, and because I know myself to be the first who ever executed crucifixes in marble."

The library is a splendid room two hundred feet in length, and contains many rare and beautiful books, among which is a splendid Old Testament of the eleventh century in letters of gold with exquisite paintings; also, a tastefully decorated copy of the Koran which is very old. We asked the custodian, what value was put upon the Old Testament, and he replied that a million dollars would not buy it. The fine, sharp portrait of Philip, which hangs in this library, represents a pale, bloodless, careworn man of seventy-two, about to bid adieu to all his grandeur and renown. Such a picture, in such a place, makes it one of the most interesting portraits in existence.

The Monastery was shut to our observation, but we heard the solemn chanting of a few monks who are permitted to occupy its cells and cloisters. Upwards of seventeen hundred mass services are required to be performed every year in the Escorial, and following the custom of her predecessors, the late Queen, when she visited the place, was in the habit of hearing midnight mass at the altar of the pantheon under the temple.

The palace "is tenantless of its heroic dwellers," the courts are deserted, and the mind of the visitor is oppressed by the gloom which hangs heavily over a venerable pile that illustrates better than books, the character of the man who built it.

The palace is now very elegantly furnished—four of the apartments, afterward fitted up by a subsequent king, in marquetry, with gold and steel door and window trimmings, cost upward of one million dollars. The temple is an enormous structure of massive granite, and beneath the high altar is a gorgeous pantheon fitted up as a burial place for the Spanish kings and queens. Philip died upon a couch within a small side chapel, through the window of which he could survey the splendid follies which he had created; and his worn-out body was carried down and deposited within a recess of the pantheon. Twenty-one years were employed in the construction of the Escorial, and Philip was accustomed to ride from Madrid on horseback to superintend the work, perching himself on an elevation where he could overlook the situation and development of his costly gridiron.

We spent five hours' hard work in wandering about the vast buildings of the Escorial.

#### American Institute Lectures.

Dec. 30.—Mr. James Hall, State Geologist, Albany; "On the Evolution of the North American Continent."

Jan. 6, 1869.—Prof. Horsford, Cambridge, Mass.; "On the Philosophy of the Oven."

Jan. 13.—Dr. T. Sterry Hunt, Montreal, Canada; "On Primitive Chemistry."

Jan. 22.—Prof. Doremus, College of the City of New York; "On the Photometer."

Jan. 27.—Mr. Waterhouse Hawkins, of London; "On Comparative Zoology."

Feb. 3.—Prof. Cooke, Harvard College, Mass.; "On the Spectroscope."

Feb. 10.—Wm. J. McAlpine, Pres. Am. Soc. of U. S.; "On Modern Engineering."

#### The Late King of Siam.

The name of the late King of Siam was Phra-Bard Sam-detch-Phra-Pharamendr-Maha-Monkut. He was seventy years of age, and had some taste for civilization, having dug canals, built forts, railways, steamboats, founded a printing office at Bangkok, and paid some attention to education. These peculiarities probably came from reading the *Evening Post*, to which he was for many years a subscriber.

The king leaves an extensive family of widows, said to be two thousand in number, to mourn his loss. He spent the last years of his life chiefly in studying Siamese theology, and in photographing his wives.

We have a very high respect for the *Evening Post*, and it is therefore with some hesitation that we disturb its theory respecting the progress made in civilization by Phra-Bard Monkut, of Siam. His late highness was a regular reader of the *SCIENTIFIC AMERICAN*, and it seems to us very likely that he learned more from its columns about forts, steamboats, railways, canals, and photography, than from the *Post*; but so far as his knowledge of theology and social science is concerned, we have no doubt that he found the *Post* an able assistant, and we hope our cotemporary will forward a copy of the paper containing the notice to each of the two thousand bereaved widows.

**Sensations in a Balloon.**

The question "Are you not dizzy in looking down from a balloon?" was answered awhile since by the *Boston Journal* as follows: "Dizziness or giddiness is something entirely unknown in aeronautic traveling, and therein is one of the most surprising facts of ballooning. You look downward with the same steadiness and composure with which you look off from a mountain top. Another strange feature is that the balloon seems to stand perfectly still. Common sense teaches you that you are moving when the distance between you and certain objects is widening, but there is no other indication of the fact, nor is there in rising and falling in the atmosphere. Immersed in the air current, and traveling at the same or nearly the same velocity, the balloon seems relatively becalmed.

This fact, the *Journal* goes on to say, sufficiently explains the utter uselessness of sails and rudder. There is no wind to fill the one, nor fulcrum or resisting force for the other. The only power of a gas balloon is its buoyant force, and thus all inward efforts at propulsion or control, beyond a simple means of rising or falling through a depreciation of the buoyant material or the ballast weight, are manifestly fruitless. Until some other inward motive power than mere buoyancy is devised, no forward step can be made in ærostatics, and the union of any other with the gas balloon is entirely hopeless, since the craft is wholly at the mercy of the element which sustains it. The wind currents, too, are so variable that navigating the air between given points under their control would be quite as much out of the question.

No difficulty is experienced at a less height than two or three miles, by persons in health, nor is any other decided sensation felt under ordinary circumstances. There may a slight ringing or closing of the ears with some persons in a less altitude, but in the upper regions a deafness is experienced. At the height of three and a half miles the atmosphere is known to have just half the density it has at the surface, and there is, of course, the corresponding decrease of atmospheric pressure. At the surface, a man of ordinary size is said to sustain an atmospheric pressure of 25,000 pounds, while at the height named it is reduced one half, the change bringing with it many discomforts. The reduction of atmospheric pressure is felt by the balloon through the expansion of the gas and the distention of its envelope, and thus to rise to great altitude necessitates an expenditure of the gas, as well as of ballast. To guard against a too sudden expansion of the balloon, the open neck at the bottom serves as a sort of safety valve, while it also becomes necessary to let out gas at times through the valve at the top.

**Exploration of Central Asia.**

At the last meeting of the Royal Geographical Society, London, Sir Roderick Murchison said the attention of the society had been strongly drawn of late toward Central Asia, and particularly to the vast regions which bordered the north-eastern and northwestern frontiers of British India. The principal region in the northeast embraced the country lying between Assam and Szechuen, the most westerly province of China. A warm desire was expressed by a committee of the British Association, as well as by the Council of the Geographical Society, that that intervening space of about two hundred and fifty miles only should be explored, in order to ascertain if there be practicable passes through the high mountains and wild tracts which separated the upper waters of the Yangtse-kiang from the Brahmaputra at its great bend near Sudiya. Although as yet no positive effort has been made to solve the important problem, the Indian authorities are making efforts to open a route of traffic along a more southerly line between British Burmah and the great Chinese province of Yunnan, now essentially independent of Chinese rule, and most desirous of establishing a trade with our settlements on the Irrawaddy.

Of still more pressing importance, however, than an acquaintance with the regions alluded to, is an exploration of the vast and unexamined tracts on the northwest, far beyond the tributaries of the Upper Indus, or between Peshawur and Jellalabad on the south, and the centers of trade and population at Yarkand and Kashgar. The main object is to define the physical character of the vast elevated plateau called Pamir, or "Roof of the world," from which the Oxus and Zarafshan take their rise, and from which the lofty chains, the Kuen Lun, the Himalaya and Hindoo Koosh radiate. In 1867, Sir Roderick urged the essential importance of such knowledge, to be acquired equally by the Russian and British governments; and he then said that this great table-land or watershed ought to be constituted the neutral ground between the two empires, and to be considered as a broad zone to be forever interposed between eastern Turkestan—toward which Russia has now advanced—and the most northern limits of our Indian possessions.

With a view to taking a first step in this desirable exploration, the Council of the Geographical Society sent out last spring a practiced traveler, Lieutenant Hayward, to traverse this region from Peshawur.

**Wooden Railways.**

The feasibility of laying wooden railways in districts where the traffic does not require a high rate of speed, and where there is an abundance of hard and durable timber, has been recently made the subject of discussion by our Canada exchanges, and by letter we are informed that the method is proposed for Australia, a kind of timber being found there which is very hard and particularly adapted to the purpose. A. M. F. P. Mackelcan, in a communication to the *Perth Expositor*, gives a favorable opinion as to their utility based upon practical experience.

The cost of such railways being so much less per mile than

those of iron, the shortening of distances by deep cutting or filling is obviated. The natural features of the district through which it passes can be complied with. The low rate of speed renders the erecting of very expensive bridges unnecessary, and as light locomotives only are proposed, the wooden rails are sufficiently strong for perfect safety.

In many parts of Canada, movements looking toward the construction of such roads are on foot, and an exchange informs us "that \$96,000 have been voted by different interested townships in aid of the Toronto, Grey, and Bruce Railway, and the Toronto City Council has passed a by-law granted \$250,000 for the same purpose. These sums, it must be borne in mind, are bonuses in aid of the road."

The *Kingston News* says that among the notices of application to Parliament appearing in the *Official Gazette*, is one relating to a wooden railway from Kingston to Loughborough and adjoining townships. "The projected railway is destined to be realized as a fact, and will prove the adaptability to the wants of the back townships of Canada. The people of Kingston are of course very much interested in the success of an enterprise so well calculated to improve the fortunes of the city, and we feel sure they will do all in their power to promote the passage of the company's charter, and to otherwise aid them in the important work." In many other places these railways are talked about. In his communication above referred to Mr. Mackelcan says:

"I would like to caution those who may patronize or push forward this new system, against making things too great and too grand, under plea of suiting the future, for in this way the present and the future are both destroyed. That which will help Canada to grow into a thickly peopled, well cultivated, and prosperous country, is a net work of cheap conveyance, created in the country by its own industry and with its own capital, and costing so little as to pay for itself in a few years."

The estimated cost of such roads is from \$4,000 to \$5,000 per mile, which seems to us to be ample. We are inclined to think much more favorably of these practical ideas than the visionary project of a British American Inter-oceanic Railway, alluded to by us in a former number. We hope the plan may be well tested, and feel quite confident it will ultimately succeed.

**GEOGRAPHICAL AND ARCHEOLOGICAL.**

*Putnam's Monthly*, for January, says:

Captain Burton (the discoverer of Lake Tanganyika) has a new book of travels in the press, under the title of "Explorations of the Highlands of Brazil," with a full account of the gold and diamond mines. Also, of canoeing down 1,500 miles of the great river San Francisco, from Sabara to the sea.

THE first complete census of the Cape Colony, South Africa, was taken in March, 1865. The enumeration, which does not include Natal and the Transvaal Republic, shows a total of 181,592 persons of European birth or descent, and 314,789 natives, the latter consisting principally of Hottentots, Kaffers, and Bushmen. From a partial census, made in the year 1853, it appears that an increase in ten years was at the rate of 86 per cent. Unlike other colonies composed of mixed races, the rate of increase was much greater among the native tribes than in the white population. Among the possessions of the colony are 226,000 horses, 250,000 draft oxen, 10,000,000 sheep, and 2,440,000 goats. In the list of productions we find 1,390,000 bushels of wheat, 1,633,000 pounds of tobacco, and 3,237,000 gallons of wine. 75,000 persons are employed in agriculture and 13,000 in manufactures. Two-thirds of the white population and one twentieth of the natives are able to read and write. Including Natal and the Transvaal Republic, thirty-two newspapers are published—ten in the Dutch and twenty-two in the English language.

LIEUTENANT WARREN is continuing his excavations at Jerusalem with equal zeal and labor. He has discovered that the foundation wall of the platform of Mount Moriah, upon which stands the Mosque of Omar, as once stood the Temple of Solomon, was originally 1,000 feet long, and 150 feet high, nearly the length and height of the Crystal Palace at Sydenham. He traced the enormous masses of stone, which are still visible at the southern end, to a depth of 45 feet below the present surface. Behind this wall there are the remains of vast tunnels, arches, and chambers, which Lieutenant Warren refers to the old Jewish Jerusalem, before the time of Herod.

THREE English gentlemen, Messrs. Freshfield, Moore, and Tucker, last summer succeeded in ascending the Elburz, the highest peak of the Caucasus, the altitude of which they ascertained to be 18,526 feet. Since geographers have adopted the axis of the Caucasus, from the Black to the Caspian Seas, as the boundary line between Europe and Asia, and the peak of Elburz lies on the European side of this line, it thus becomes the highest mountain in Europe, exceeding Mont Blanc by more than 3,000 feet.

THE committee charged to collect funds for the French expedition to the North Pole, has published a report, stating that the vessels will be in readiness by the commencement of this year. It is intended to despatch the expedition from France in January, if possible, in order that it may reach Behring's Strait by the end of July.

PETERMANN'S "Mittheilungen" in Gotha publishes a map of Lower California, from the exploration made by J. Ross Browne, Gabb, and Lochr. An account of the journey, with interesting geological details, from the pen of Herr Gabb, is added.

**Editorial Summary.**

AGASSIZ'S EXPLORATIONS IN BRAZIL.—The geographer Petermann says of Agassiz's "Explorations in Brazil": "The history of scientific expeditions has scarcely an example which, in point of brilliancy and aid rendered from all quarters, can be compared to this journey of Agassiz. It is known that since his settlement in Cambridge, he has received such a recognition and support from the Americans, as a man of science has seldom enjoyed, and it now appears from his work on Brazil, that also in South America all classes of the people united to do him honor. Had Humboldt visited Brazil during the last years of his life, his reception could not have been more splendid."

A GOOD story is told of a merchant whose business is located on the eastern side of the Sierra Nevada. Being in want of additions to his stock he purchased goods in San Francisco and ordered them shipped via the Central Pacific Railroad to its terminus at the time the goods were shipped, supposing that by the time the goods were ready, the road would have progressed nearly to his location. Such progress was made in the interim, however, that the goods were delivered at a point fifteen miles on, from whence they were carted back to their destination.

TO REMOVE SUBSTANCES FROM THE EYE.—To remove foreign bodies from beneath the eyelid, take hold of the upper eyelid, near its angles, with the index finger and thumb of each hand. Draw it gently forward, and as low down as possible over the lower eyelid, and retain it in this position for about a minute, taking care to prevent the tears from flowing out. When, at the end of this time, you allow the eyelid to resume its place, a flood of tears washes out the foreign body, which will be found adhering to, or near to, the lower eyelid.

SMOKE WREATHS.—We are in receipt of several communications in regard to smoke wreaths which we are obliged to pass by. The subject is of little or no practical importance. Such wreaths are caused by friction upon the external portion of a volume of smoke caused by its partial adhesion to the walls of the gun, tube, or aperture through which it is forced. This gives a rolling motion from the center of the volume outward and produces the phenomenon. With this explanation we dismiss the subject.

THE removal of Union College from Schenectady to Albany, N. Y., and making it in connection with the Albany Medical and Law schools, and the Albany Observatory, into a State University is strongly urged. It is asserted that if the citizens of Albany will raise \$500,000, the trustees of the College will consent to the arrangement and transfer the entire college apparatus, cabinets, library, etc., and the college endowment, now estimated at one million five hundred thousand dollars.

WE understand that the splendid collection of engineering models, belonging to the late Professor Gillespie, of Union College, Schenectady, has passed by purchase into the possession of that institution. It is probably the finest collection of engineering models and instruments in the United States. The department of engineering is now under the direction of Prof. Staley, a former pupil and assistant of Prof. Gillespie, and a gentleman of singular ability in his profession.

BARON JAMES DE ROTHSCHILD, who died in Paris, November 15, left a fortune estimated by the French papers at \$400,000,000. Most of this is in stocks, money, and portable securities; but he had also splendid town and country houses, the latter close to the Bois de Boulogne; and fifty-one other houses in Paris; palaces at Rome, Naples, Florence, and Turin; and more or less property in nearly every great city of Europe.

OLMSTED'S SELF OILER.—In the description accompanying the engraving of the oiling device in the last issue of the SCIENTIFIC AMERICAN, it is stated that it was patented Jan 21, 1868. That is the correct date of the oil cup patent, but the hollow shaft patent was issued as long ago as May 2, 1865.

AN eastern professor states that the meteoric showers of the last two years were occasioned by the tail of a comet which passed in 1866. He estimates the flow as being 200,000 miles per day, and that it has been nearly three years in passing. Truly this is a stupendous tale.

A NEW method of attaching the soles of boots and shoes to the uppers has been patented. Copper wire is used for stitching instead of the ordinary shoe thread. It is claimed that superior strength is gained by this method, with but a trifling increase in the cost of the work.

A KENTUCKIAN writes to the *Northwestern Farmer*, that of a lot of telegraph poles put up in Kentucky, the chestnut rotted first, the cedar gave way next, the locust stood five years longer and are still nearly sound.

A YOUNG writer having asked the *Petersburg Express*, which magazine would give him most speedily the highest position, was advised by the editor to contribute a fiery article to a magazine of powder.

IT is stated that the Czar of Russia has sent two engineers to inspect the Pacific Railroad, with a view to utilizing whatever information they may obtain in the construction of a road from St. Petersburg to Chinese Tartary.

A SINGLE establishment in Vermont turns out 100,000 slate pencils per day. How many little fingers and young brains they must keep busy.