# [MAY 26, 1877.

# POMPEII.

To alight from a railway train, to purchase a ticket of admission, to negotiate with a guide, and then, after walking a couple of hundred yards, to find oneself transported back and brought face to face with the every-day life of eighteen centuries ago, is to experience a sensation which no subsequent visiting of famous relics of the past can ever efface from the mind. An ancient ruin is but a heap of stone, whether in Mexico or in Egypt. The massive blocks of Stonehenge or those of the Ephesian Temple of Diana mean nothing to those who, from their knowledge and imagination, cannot call up mental pictures of the circumstances under which they were erected; and it requires no small effort on the part of even those possessing the appreciative faculty to exercise it, when a locality hitherto surrounded with a halo of romance, sentiment, or historical interest, is for the first time viewed from the window of a nineteenth century railway train. Pompeii is perhaps the one exception. Tourists who have wearily ascended Pisa's leaning tower and thought of nothing but the steepness of the stairs, or who have "done" the Acropolis at Athens at sunrise, with the idea of breakfast uppermost in their minds, find in the exhumed city an interest which leaves no room for such incongruous feelings. It is the interest which attaches to all things personal, the same interest which induced thousands at the Centennial to turn their backs on the magnificent Castellani collection of antiquities and linger in the New England kitchen.

To reach Pompeii from Naples, a fifty minutes' journey by the railroad which skirts the bay is necessitated. The line cuts through the great lava stream of 1794, over two thousand feet wide and forty feet thick, at the base of Vesuvius, and passes a number of little villages, inhabited (in the face of constant danger from earthquake) on account of the great fertility of the soil. On reaching his destination, the visitor pays a small admission fee, and enters at once into the streets of the ancient city.

Pompeii was partly destroyed by two earthquakes in

cloud of black smoke burst forth from the crater, and settled thickly over the town, plunging it in complete darkness. A dense rain of thin light ashes followed, and then showers of hot stones, mingled with masses of lava giving off mephitic gases. Meanwhile great rivers of black lava poured irresistibly down the mountain sides, filling the streets and cutting off the exit of those who had taken refuge in cellars; while others, who were attempting to leave the city by the gates, were blinded by the drifting ashes and overcome by the sulphurous vapors. For three days this terrible infliction continued; and then, when the smoke dispersed, where once was a beautiful town was but an arid mass of ashes, pumicestone, and hardened mud.

Centuries went by. The rich volcanic soil became covered with a profusion of vegetation, and a new town sprung up over the buried city, only to be destroyed by earthquake four hundred years after the great eruption. Pompeii then existed only in tradition;

In the middle of the last century, the finding of relics in the

excavations. An inscription was soon unearthed establishing the fact that the true Pompeii had undoubtedly been found; and since that time the work of uncovering the buildings has been slowly and carecarried on.



Fig. 1.-CLEARING A STREET

building the injured portion, when, on August 24, 79, a great | ever, the presence of the ashes has proved a positive advanbreak that the escape of the people was prevented. A dense closely around perishable objects they have formed perfect ready exhumed!-many in such positions and circumstances

floor, as their weight naturally carries them downwards through the soft mass of ashes. The digging is therefore rapidly prosecuted until the above uniform level is attained. Then shovels and picks are put aside, and the ashes are taken out by handfuls, each workman carefully crumbling the material to powder before rejecting it. As soon as the experienced eye of any worker recognizes the indications of a mould being formed in the ashes, labor near that point is stopped, and tamping irons are cautiously inserted to make two or three vents in the cavity. Then liquid plaster is poured in; and after being left sufficiently long to harden, the ashes are taken away and the cast removed. Fig. 9 is from a photograph of casts thus obtained. The bodies are those of two women, apparently poor people, as on the finger of one an iron ring was found. The elder one has the limbs drawn up as if in agony; the other, a girl probably of fifteen years of age, is more composed. One of the hands is half open, as if holding something. The texture of the dress is exactly reproduced, even to the stitches of the seams.

It is believed that of the inhabitants of Pompeii thousands perished Many hand in hand groped their way through the streets, and so escaped to the open country. At the chief gate there stood a sentinel, who sternly kept his post through the thunders of that dreadful day. He died in harness. Planted in his sentry box, he covered his mouth with his tunic, and held on against the choking and sulphurous shower. But the ashes fell and fell, and finally filled the box, and buried the soldier alive, still grasping his weapon in one hand and veiling his mouth with the other. There, after ages of rest, he was found-a grisly skeleton clutching a rusty sword.

Sad discoveries were made in the street leading to that gate. There were two skeletons locked in close embrace, the teeth perfect, indicating youth in its prime: skeletons of a young man and maid. They had fallen together in their flight, and death had wedded them. There was a mother with her three children hand

the year 63 A.D. Its inhabitants were still engaged in re- | close texture and now harder than stone. Generally, how- | in hand, who tried vainly to outrun death. Perhaps the mother singly might have done it, but she could not leave eruption of Vesuvius overwhelmed the city and the adjacent tage, because in opening a street for example, as shown in her children. Plenty of food for sad thought is furnished towns of Herculaneum and Stabize. So sudden was the out | Fig. 1, they are easily dug out and removed; while by packing in remembering that six hundred skeletons have been al-



An interesting little circumstance is connected with one of these houses. The skeleton of a dove was found in a niche overlooking the garden. Like the sentinel, she had kept to her post, sat on her nest through all the storm, and from beneath her was taken the egg she would not leave.

The shops and taverns which have been exhumed are very interesting as illustrating the domestic life of the people. Fig. 5 represents the interior of a baker's shop. Eighteen hundred years ago, the baker, having placed his loaves in the oven, had closed the iron

onions, figs, fish cooked in oil, and

other articles of food, some retaining their natural appearance and all plainly recognizable. It is a curious fact that a precisely similar mode of cookery prevails in the modern Italian villages to that indicated by the utensils and prepared food found in Pompeii; and in some instances vessels have been found which might at the present day be put to their original use, as they differ little from those now employed. In one eating house, for instance, is a dresser of brickwork in which are large metal and earthenware vessels for soup, with furnaces to keep it warm and ladles to distribute it, precisely as are used in modern restaurants. Amphoræ of wine are marked with the year of the vintage, the characteristic quality, and the name of the wine merchant from whom they were purchased. Taverns are indicated by checkers on the doorpost, or by a sign painted on the wall. The streets are paved



Fig. 2.-SEARCHING FOR RELICS.

and this located the lost city several miles from the un-| moulds, retaining the form of the objects after the same have | door, when he had to fly for his life. A few years since the inhabited plain under which it was eventually discovered. wholly decayed and disappeared. The work of removing the batch was drawn. The loaves are jet black, and of stony débris from a room is represented in Fig. 2. It is not frequently hardness; but the marks of the baker's fingers show plainly vicinity induced the government to undertake systematic that articles are found at a height above four feet from the on them. In an eating house were found raisins, olives,



fully

A fine series of engravings, from "Italian Pictures Drawn with Pen and Pencil," presented herewith, give an excellent idea both of the appearance of the excavation and the manner of conducting the work. Fortunately the material which chiefly covered the city was not lava, which would have set like stone after probably burning paintings and melting objects in metal, but a fine light ash, which insinuated itself into the minutest crevices, and even through porous earthenware. The writer assisted in opening a large wine jar still bearing the seals placed over its mouth at the time of filling. The white ashes had replaced the wine, and had made their way through pottery of

Fig. 3.-THE GATE OF HERCULANEUM AND STREET OF TOMBS.

wheels; and at one drinking fountain, where slaves stooped and drank from the flowing spout, on the edge of the trough is a spot worn smooth by the pressure of the many hands that rested against it.

The dwellings for the most part are small and low, few

ternally, and are well adapted to a people accustomed to pass most of the day in the open air. The upper stories, being of wood, with flat roofs, were speedily consumed; but as those portions of the house were generally used as storerooms or apartments for servants, their loss is of little consequence. The ground apartments have escaped serious injury; and on their walls some of the frescoes appear as brilliant as if recently painted. Figs. 6, 7, and 8 afford an excellent idea of the various objects found in the dwellings, as well as of their remarkable state of preservation. Fig. 6 shows a collection of cooking utensils. It is hardly necessary to call attention to the colander, the frying pan, and the forks and spoons, as being the same as those now used. Gold ornaments, copied from the designs shown in Fig. 7, are now quite common; and many of the terra cotta lamps depicted in Fig. 8 have served as suggestions for the patterns of modern gas fixtures.

The walls of the city, which have been traced throughout their full extent, indicate that an irregular oval

20,000 to 50,000, but according to Signor Fiorelli, the general superintendent of the excavations. Pompeii had not more than 12,000 inhabitants at the time of the eruption. Eight gates have been discovered, and the roads outside of

fore the gate of Herculaneum, Fig. 3, was probably the principal burial place of the city; and the sepulchral monuments adorning it give evidence of the refined taste and great wealth of prominent Pompeiians. The streets, which for the most part run in regular lines, are with some exceptions barely wide enough to admit a single vehicle. The widest does not exceed 30 feet in breadth, and few exceed 22 feet. Five of the main streets have been partially or wholly traced; and with these a regular system of minor streets appear to have been connected. These thoroughfares, with a single exception, terminate in or traverse the western quarter of the city, which is the only part yet completely explored. The public buildings were profusely decorated structures, and included temples of Jupiter, Mercury, and Venus, besides two theaters. The thermæ or public baths -a room in one of which is represented in Fig. 4-were elegantly adorned.

The most important paintings and objects of art discovered by excavation have been deposited in the Nation-

ing 81 laborers daily, the whole city will be unearthed in 1947.

Hindoo Snake Charmers

with solid blocks of stone worn in deep ruts by chariot man keeps up a perpetual tapping on a tom-tom drum, while he keeps up an animated conversation with Emman and Gheesa. Seved Emman is dressed in the Hindoo fashion: he wears a resplendent turban, a very handsome silver waistband, and massive silver anklets ornamented with bells; his assistants are also well dressed, their copper-colored skins exceeding two stories. They have little ornamentation ex- contrasting well with the ornaments they wear. To heighten brilliant eyes. It is very beautiful to see the wonderful way

are sometimes called, double-headed snakes; the next, a large lacertine; the others, cobras. While four of the snakes are crawling about the platform, the charmer pays especial attention to one of the cobras. The instant the lid of the basket is off, up rises the cobra as if impelled by a spring. This cobra is a large snake and prettily marked; he has especially

in which he expands his hood. This

"I observed what I did not know

"The anatomy of the cobra should

be known to all our readers. When he

is quiet and undisturbed, his hood does



Fig. 4.-TEPIDARIUM OF PUBLIC BATH.

has generally been supposed that the population was from in yellow ocher. Seyed Emman comes out on to the platform carrying his snakes suspended to a bamboo over his shoulder; the snakes are carried in baskets beautifully made of bamboo. He places the baskets on the earth, and dances round them frog fashion, all the time playing a curious Inthem were lined on each side with tombs of considerable dian instrument that look likes a cocoanut with a penny size and architectural pretension. The Street of Tombs, be- whistle attached; this is called a surringhee. It appears that

area of about two miles in circumference was occupied. It the effect, Mr. Gheesa had painted his forehead and arms not appear at all. This hood is formed by a loose skin immediately below the animal's head. It is erected by a beautiful mechanism formed by the ribs, which are so fitted to the vertebræ that they can be spread out at right angles, and so erect the hood. Hence the name cobra di ca pello, of the hood. The cobra that was made to dance, so far as I could see, was the naja tripudians, or 'naga.' "Sir Joseph Fayrer, M.D., in his remarkable work, 'Tha-

natophidia, or Death Snakes of British

India,' writes: 'Cobras are most deadly: they all have the hood, and they never attack without distending it; they raise the anterior third of the body from the ground, slide along slowly on the posterior two thirds, and with the hood dilated, remain on the alert, darting the head forward to attack when anything hostile approaches. The cobra is a nocturnal snake; it feeds on birds' eggs, fish, frogs, and insects. They are not unfrequently found in roofs of huts, holes, and old masonry, etc. The cobra is most deadly, and its poison quickly fatal: paralysis of the nerve centers takes place, and death occurs with great rapidity, sometimes in a few minutes, especially when the fangs have penetrated a vein and inoculated the poison instantly in the venous circulation. The number of deaths caused yearly in India by these snakes is perfectly appalling. The cobras are the favorites of the snake catchers, and it is astonishing with what ease and freedom the reptiles are seized and handled by these men, even while in possession

Fig. 5.-BAKER'S OVEN, BREAD, AND FLOUR MILLS.

al Museum at Naples. Until recently the excavations have | nothing can be done without formal incantations-frog dan- | of all their fangs.' proceeded slowly; but at present the Italian Government is cings, and a great deal of talking and shouting. After Seyed "The cobra has several (some five or six) poison fangs on liberally assisting the work. The space now laid bare meas Emman has sufficiently charmed the snakes in the baskets, ures about 670,000 square feet, or one third the whole area he lifts off the covers of three of them, and dexterously are perforated, the hole being just large enough to admit the occupied by the city. Signor Fiorelli calculates that, mak- twitches the living contents on to the platform. The first bristle of a hairbrush. In connection with the upper end of ing the excavations on an average 25 feet deep, and employ- basket contained two specimens of amphisbena, or, as they the tooth, there is a duct communicating with a poison



each side at the edge of the roof of the mouth. These fangs gland the size of a large nut. The cobra

may be said rather to strike than to bite. It does not lay hold, as does a dog, but it gives a quick and almost instantaneous

Frank Buckland, the naturalist and writer, informs the readers of Land and Water that at the Westminster Aquarium, London, a company of three or four snake charmers have recently arrived from India. He states that not for twenty years have these curious people, with their wonderful tricks, appeared as exhibitors in London.

"The performance takes place in the northwest corner of the Aquarium. Convenient seats have been arranged so that every one can have a good opportunity of seeing what is going on. In order that there shall be no suspicion of trapdoors, etc., the platform on which the performance takes place is composed of solid earth. The performers are three in number: the principal actor is Seyed Emman, his assisttant is called Gheesa. There is also present a very intelligent-looking slim boy named Moen Deer. This young gentle-

Fig. 6.-POMPEHAN COOKING UTENSILS IN THE MUSEUM AT NAPLES.

stab with its teeth; the poison runs down -the word is rather injected-into the wound made by the tooth. I myself have had very unpleasant experience of cobra poison. I was dissecting a rat which had just been struck by a cobra. In skinning it, a minute drop of the poison got under the nail, and the symptoms were very unpleasant. I have examined the cobra poison under the microscope; it is colorless, slightly viscid, something like clarified honey. On two occasions I have watched the poison form itself into crystals when under the microscope. This had been seen and described a hundred years ago by Dr. Mead. Microscopists of the present day say that this crystallization is simply drying. Iam of different opinion. I believe that these crystals are sui generis. The subject is well worthy of further investigation, though the operation of procuring the

poison is somewhat dangerous; poison may, however, be procured from the fangs of living or recently killed vipers.

"The next trick performed by Seyed Emman is the conversion of the dried skin of a little animal into a living beast, which beast turns out to be a mongoose, and a fierce Turkish language may be as easily procurable in the towns little animal is this mongoose. A dried skin of a cobra is next placed on the ground, the charmer dances round it and pipes on his cocoanut a stirring strain which reminds me very much of Highland bagpipes. He rolls this skin up and places it in a covered basket, from which basket in due time he produces a second living cobra, rather larger than the first. This cobra seems a very spiteful gentleman; he made distinctly two or three fierce lunges at the charmer, and I could distinctly see his mouth wide open when he made his strike. This experiment of converting a dried cobra skin into a living cobra is, I should fancy, a repetition of the trick we read of in Exodus: 'Then Pharaoh called the wise men and the sorcerers. Now the magicians of Egypt they also did in like manner with their enchantments, for they cast down every man his rod, and they became serpents.' The next trick is making a shrub grow into a small tree under a basket. A

seed is placed in the ground. The first time the basket is lifted off the seed has grown into a small plant. At each taking off of the basket the plant is discovered to be larger and larger. The trick is very cleverly done, as the man is sitting in the middle of the stage, which is, as I said before, formed of earth. Other very ingenious tricks follow, and the performance is terminated by the celebrated basket trick. The boy, Moen Deen, is tied hands and feet, and then completely inclosed in a large cabbage net. The young ráscal, grinning all over with apparent delight, is then dropped, like a pudding into a pot, into a very small basket, which seems hardly big enough to hold a brace of hares; the lid is then put down. Incantations are performed while the cloth is thrown over the basket, a sharp sword is then thrust through the basket in all directions. When the cloth is removed the boy is found released from the net, and jumps out of the basket disappeared from the basket, and suddenly reappeared on what is recognized as the oldest copy extant of the New Goshorn, late Director-General, and Mr. Clement M. Biddle, the platform, whence or how I really cannot understand.

"Altogether this is a very interesting performance, and brings before our eyes scenes which most of us have heard, but few have had an opportunity of seeing. After the performance was over, I interviewed the charmers; they told me they were obliged to take very good care of their cobras as the weather was so cold. Dr. Lynn has telegraphed to India for more cobras, and some twenty or thirty more of these venomous brutes are shortly expected. It will then be an interesting sight to see Seyed Emman handle these newly caught specimens."

# Photographic Bibliography.

Photography during its brief career has already had numerous applications-some exceedingly useful, but others less so. As a means of supplying facsimile copies of valuable documents it is unrivalled; and reprints, in facsimile, of original editions of the works of Shakespeare, Holbein, and other authors of past times, as well as copies of certain manuscripts of Burns and other modern authors, are now easily accessible. The forthcoming

tion of printing into England has afforded certain writers an Petersburg, where it is only to be consulted under the occasion for instituting comparisons between the wonderful strict surveillance of an armed guard. If this valuable work sacred writings connected with other religious faiths. It to photography alone, how many disputed minor points of

duction and multiplication of copies of the Koran. The precise nature of the existing objection to the use of types in connection with the reproduction of the Koran we cannot at present ascertain, although we have made inquiries from those who are believed to be in a position to know. Hence up to the present period all copies of the Koran made use of by the adherents of the Mussulman faith have been laboriously produced by writing with pen and ink. That this has arisen from a desire to keep their "book of the law" free from error is without doubt, although, reasoning from strict analogy, this seems to be the very best means of introducing error. It is pleasing to find that the high religious authorities of the Mohammedan faith have at length decided that although the typographic art, pure and simple, may not be applied to the reproduction of the Koran, the art of photography may be invoked to provide the means of disseminating their sacred in such reproduction. By means of photolithography and phototypography-the latter of which is suitable for working at a modern printing maching—it is not too much to say that in a brief period copies of the Koran in the original and villages of Oriental countries as they now are in London,



where the English translation may be obtained at any bookstall at a shilling per copy.

Of still greater interest would it be if the Russian Governunhurt. On another occasion, when I was present, the boy ment allowed a photographic reproduction to be made of President of the Centennial Board of Finance, Hon. A. T.



## Fig. 8,-BRONZE AND TERRA COTTA LAMPS.

advent of the four hundredth anniversary of the introduc- Testament, to be found in the Imperial Library, at St. | Post Office building in this city, shows that, on the removal of a wall in the fourth story, the remainder of the same wall on the story above was left standing, but was supported by extent of the circulation of the Bible compared with the were reproduced with the degree of accuracy appertaining two light 15 inch iron beams, which were not deemed competent to sustain the load. Accordingly this superincumhas been stated that there exists a law of the Mohammedan doctrine might not cease to exist! It is well known among bent wall was removed, and an iron truss substituted for it, religion prohibiting utilizing printing types in the repro- bibliographers who are students of the New Testament in the in order to uphold the roof. This truss, with the iron roof



such "marks" have been intentionally made or varied with the view of supporting special dogmas. By the production of one good photographic copy all such differences would cease to exist.

As public attention will inevitably, by the new and liberal policy of the Mohammedan religious functionaries, be directed to the reproduction of other works by similar agencies, we anticipate a rapid demand for facsimile reprints of rare works. For the most part, such reprints have hitherto been made by the aid of photolithography; and with such a work as Holbein's "Dance of Death" on our shelves before us, it would be unjust to say that this process is not equal to the task of facsimile reproduction. Still it is in phototypography that the art of reproducing scarce works will find its chief outcome, speed and quality being alike the concomitants of this method of printing .- British Journal of Photography.

## New Drawing Scale.

An instrument for reducing or enlarging drawings, called a planigraph, has been invented by M. Marmet, of Versailles. It consists of a rule carrying two scales which have different graduations, and are placed end to end in opposite directions. At the common origin of the scales is a needle about which the rule can freely turn. Reading on one side, the vector radii of the different points of a given figure, and marking on the other side the points designated by the same numbers, you obtain a figure reduced or enlarged in the proportion resulting from comparison of the scales. These scales are fixed to the rule by screws. There are five for each side, among which choice is made according to the reduction required.

#### The Opening of the Permanent Exposition.

The Permanent International Exposition in the Main Centennial Building, Philadelphia, was formally opened on May 10. Speeches were made by the Hon. John Welsh,

of the Permanent Exhibition Company. The music rendered by a large chorus and orchestra, was nearly the same as at the Centennial opening. President Hayes declared the show open for the season, but forgot to touch the button which signalled to start the machinery, as it was intended he should do. The crowd was large and not very orderly; but the ceremonies passed off reasonably well. At present the condition of the exhibits is as usual-by which we mean incomplete, as is invariably the case in every fair of this description on the opening day. There is every indication, however, that the display will be a creditable one; and the new arrangement of the huge building affords excellent facilities for comparison and study of exhibits. When the Exposition is reduced to good running order, we shall lay before our readers whatever there is therein of novelty and interest.

# The Fall of the New York Post Office Roof.

The verdict of the coroner's jury, after examination into the causes which recently led to the fall of a portion of the roof of the new

> beams, not being strong enough to stand the stress, the fabric, under its load of concrete, fell. Ex-Supervising Architect Mullett is charged with fault in the matter; but that gentleman appeals from the verdict, which he says emanates from professional rivals, and asks that an examination be conducted by the Chief of Engineers, U.S.A.

Fig. 9.-CASTS OF HUMAN BODIES FOUND AT POMPEII.

# Pitury, an Australian Rival to Coca.

Baron Von Müller, of Melbourne, has at length determined the botanical source of the "pitury," a stimulant long known to be in use by the aborigines of Central Australia, and said to be of marvellous power. After some years of efforts to obtain a specimen, he has with certainty determined them to belong to Duboisia Hopwoodii, a bush referred to the order solanaceae. In the Australian Medical Journal, Baron von Müller states that the natives chew the leaves to invigorate them during their long foot journeys through the deserts,

another copy of its pages be obtained by photo-mechanical

writings. It is believed that if a copy of the Koran recog. | original Greek that, by the introduction in the copies of ap- | just as coca leaves are used in South America. It is carried nized as perfectly accurate be placed in the light, and parently triffing marks of no larger dimensions than a comma, about by them in little bags. It is also employed to exthe whole sense of a passage may be inverted or, at least, cite courage in warfare. We shall probably soon hear conmeans, there will obviously be no chance of errors occurring seriously modified, and it has frequently been insisted that cerning its therapeutic qualities.

# The Achievements of Science.

the popular stereoscope instrument, recently delivered an saltpeter (KNO<sub>3</sub>), whereby nitric acid is generated on boil- of circulation. For advertises desiring to reach certain sections of the address before the Boston Microscopical Society. It was ing. Chlorate of potassium was also mixed with the citric country, there is a carefully prepared list of periodicals arranged by counaddress before the Boston Microscopical Society. It was ing. Chlorate of potassium was also mixed with the citric mainly an illustration of the progress of microscopy-in the acid, but with less satisfactory results. construction of the instruments and in the discoveries by their aid. "To those of my generation," he began, "this acid (Si  $O_2$ ), either pulverulent or gelatinous, separates. modern world which most of you take as a matter of course, it being the only condition of things of which you have had hydrofluoric acid is evolved, which is able to attack most of experience, is a perpetual source of wonder-a standing mira- the silicates not otherwise decomposed, including all the Science and art have in our time so changed the ascle. pect of every-day life that one of a certain age might well believe himself on another planet or in another stage of existence. The wand of Prometheus is in our matchboxes; the rock of Horeb gushes forth in our dressing rooms; the carpet of Arabian story is spread in our Pullman car; our words flash from continent to continent; our very accents are transmitted from city to city; the elements of forming worlds are analyzed in our laboratories; and, most wonderful and significant of all, the despotic reign of tradition received its deathblow when the angel of anæsthesia lifted from womanhood the worst terrors of the primal malediction.'

# Mind and Health.

The Science of Health says on this subject: "The mental condition has more mfluence upon the bodily health than is generally supposed. It is no doubt true that ailments of the body cause a depressing and morbid condition of the mind; but it is no less true that sorrowful and disagreeable emotions produce disease in persons who, uninfluenced by them, would be in sound health-or, if disease is not produced, the functions are disordered. Not even physicians always consider the importance of this fact. Agreeable emotions set in motion nervous currents, which stimulate blood, brain, and every part of the system into healthful activity; while grief, disappointment of feeling, and brooding over present sorrows or past mistakes, depress all the vital forces. To be physically well one must, in general, be happy. The reverse is not always true; one may be happy and cheerful, and yet be a constant sufferer in body."

#### .... Curious Electrical Experiment.

If an ebonite electrophorus be whipped with a fox tail, it is negatively excited, and the condenser gives positive sparks. If, again, the electrophorus be rubbed with leather on which is some mosaic gold, the ebonite disk is positively excited, and the condenser gives negative sparks. It is stated by M. Schlosser, however (Poggendorff's Annalen), that if the same ebonite disk be excited on one side with the fox tail, on the other with mosaic gold on leather, one may at any moment obtain from the same disk positive or negative electricity, according as the one or the other surface of the electrophorus is used as the source. The most important point in this double excitation is the very much greater length of spark, as is readily observed by the eye. On the other hand, considerably shorter sparks are obtained from the same electrophorus when both sides are similarly excited, for example, whipped with the fox tail.

## NEW YORK ACADEMY OF SCIENCES.

A regular meeting of the Academy was held in its rooms, at 64 Madison Avenue, on Monday evening, May 1, 1877, Dr. J. S. Newberry, President, in the chair. The audience, drawn together by the announcement of an exceedingly important paper on a new and interesting subject by one of our leading chemists, was unusually large and intelligent, and paper; the solutions with appropriate reagents. included several ladies.

After the transaction of some routine business, Dr. H. on May 14, 1877. Carrington Bolton read a paper on the

#### ACTION OF ORGANIC ACIDS ON MINERALS.

The speaker at first described the use of organic acids in quantitative analysis to prevent the precipitation of certain metals, and the use of tartaric acid in Fehling's sugar test, and to dissolve antimony, etc. The use of organic acids for decomposing minerals is, however, a novel one. While on a mineralogical tour in North Carolina, he had frequently felt the inconvenience and danger of carrying a bottle of mineral acid for recognizing the carbonates; and he determined, on his return, to try to substitute for it some crystalline organic acid To his surprise, the results were very satisfactory; and he extended his investigations to a dozen different carbonates, eighteen sulphides, twelve oxides, twenty-four silicates, and several miscellaneous minerals, in all 120 specimens, embracing 90 different species. The action of citric, tartaric, oxalic, malic, pyrogallic, benzoic, and other acids was studied. The for 1877 has been issued, and forms as usual a huge volume of over a thoufollowing are a few of the points noticed: Organic acids act more slowly than mineral acids, and frequently some time stead of the steady in the number of journals which has taken elapses before effervescence begins. Citric acid acts most place hitherto from year to year, during 1876 there has been a falling off of more slowly than mineral acids, and frequently some time rapidly and satisfactorily; next to this is tartaric acid; oxalic acid acts in a similar manner, but more frequently forms insoluble compounds, which are sometimes characteristic of any lack of newspapers, despite this diminution, as the total still aggregates the mineral. Acetic acid does not have any effect on the carbonates; and when heated to boiling, the acid distils off, whereas the other acids are concentrated by boiling. Glacial acetic acid does not act unless somewhat diluted. Formic acid is more active than acetic. Propylic acid decomposes several carbonates; pyrogallic acid decomposes calcite. A few experiments were made with metals. Citric and tartaric acids dissolve iron; and citric acid, with zinc, can be employed to generate arsenurietted hydrogen.

Dr. Oliver Holmes, the poet, author, scientist, inventor of alone, the experiment was tried of mixing citric acid with

When silicates are boiled in a solution of citric acid. silicic

By mixing citric acid with fluoride of ammonia (NH<sub>4</sub>F) constituents of our common rocks. The following table shows at a glance the

MINERALS DECOMPOSED BY CITRIC ACID ALONE AND WITH REAGENTS.

### The mineral tested is to be in a fine powder. To the cold

	In the cola.	
Α.	В.	C.
Without evolution of gas.	With liberation of CO <sub>2</sub> .	With liberation of H <sub>2</sub> S.
Brucite. Anglesite. Pyromorphite.* Vivianite.	Calcite. Dolomite.* Ankerite.* Gurhofite. Rhodochrosite.* Smithsonite.* Witherite. Strontianite. Barytocalcite. Corpusite	Stibnite, Galenite, Sphalerite, Pyrrhotite,
	Malachite.	
	Azurite.*	
	On boiling.	
D, Without coolution of	E. With liberation of	F. With liberation of
gas.	$CO_2$ .	$H_2S.$
Zincite.	Magnesite.	Bornite.
Gypsum.*	Siderite.	Bournonite.*
Apatite.*	Pyrolusite.	And those in C.
Cuprite.	Wad. *	
And these in A	Mongonito 4	
And those in A.	Psilomelane 4	
	And those in B	
_		
G.	H.	•
jelly (SiO <sub>2</sub> ).	a with separ SiO	
Willemite.	Wollastonite.	Analcite.
Datolite.	Chrysolite.	Chabazite.
Pectolite.	Chondrodite.*	Stilbite.
Calamine.	Chrysocolla.	Serpentine.
Natrolite.	Prehnite.*	Chrysotile.*
	Apophyllite.*	Retinalite.
	Rhodonite.	Deweynte.
I.	К.	L.
Decomposed by	Decomposed by	Minerals not decom-
acid $+$ KNO <sub>3</sub> .	acid $+ NH_4Fl$ ,	reagents,
Argentite.	Olivine.	Molybdenite.
Chalcocite.	Wernerite.	Cinnabar.
Pyrite.	Orthoclase.	Magnetite.
Marcasite.	Albite.	Hematite.
Niccolite.	Labradorite.	Unromite.
Smaltite.	Augue. Dionsido	r ranklinite, Cruolito
Ullmonnito	Hornblende	Fluorite
Arsenonyrite	Kvanite	Samarskite
Tetrahodrite.	Talc.*	Muscovite.
Uraninite.		Biotito
	Spodumene,*	DIUTITE.
And those in F	Spodumene.* 7. Almandite.	Ripidolite.
And those in F and C.	Spodumene.* 5. Almandite. Epidote.	Ripidolite. Tourmaline.
And those in F and C.	Spodumene.* F. Almandite. Epidote. And those in G.	Ripidolite. Tourmaline.

The gases evolved are examined with acetate of lead test

The next chemical meeting of the Academy is to be held

# NEW BOOKS AND PUBLICATIONS.

DRAUGHTSMAN'S ALPHABETS. Price \$2.00. New York city: A. J. Bicknell & Co., 27 Warren street.

An excellent collection of alphabets suitable for titles, etc., to drawings and maps. Many of the old styles of letters given are rarely found in books of this description, and in their quaintness and beauty form pleasing variety as compared with the fancy alphabets now conventionally employed. Modes of shading charts, and the various signs for meadows, woods, gardens, etc., used in chart drawing, are added.

AN OUTLINE OF THE STRUCTURE OF THE PIPE ORGAN. By William H. Clarke. Illustrated. Price \$1.50. Boston, Mass: Oliver Ditson & Co.

There is very little literature on theorgan suitable for conveying to organists, church committees, and musical students, a clear, simple, and comprehensive view of the instrument. Such, however, is the aim of the present work; and the author has accomplished his task with much suc-To the student of the organ, the book can be especially commended, pipe, which is perforated with numerous small holes, to allow the steam to cess.

In the case of minerals not attacked by an organic acid complete list of newspapers and periodicals published in the United States and British Provinces, with the frequency and days of issue, the politics and other distinctive features, and in most cases a statement of the amount ties. Catalogues of daily, weekly, religious, and agricultural papers are appended. To this is added much valuable information as to the peculiar advantages which each periodical offers to the subscriber or advertiser. The volume is handsomely printed and bound, and is embellished by por-traitson steel of leading journalists. It is sent to any address for one dollar. Messrs. S. M. Pettengill & Co. have been our neighbors for several years. occupying offices in the same building with the SCIENTIFIC AMERICAN. We can speak well of their integrity and good ability in conducting their business with both advertisers and publishers.

### Inventions Patented in England by Americans.

From April 10 to April 23, 1877, inclusive. BREECH-LOADING GUN.-B. Fasoldt et al., Albany, N. Y. CARTRIDGE SHELL.-C. D. Leet et al., Springfield, Mass. CIGAR LIGHTER, ETC.-R. R. Moffatt, Brooklyn, N. Y. CIGAR LIGHTER, ETC.-G. Selden, Erie, Pa. COAL OIL STOVE.-J. A. Frey, New York city. FIRE EXTINGUISHER.-H. S. Maxim, New York city. FLUTING MACHINE, ETC.-C. M. Meserole, New York city. FRUIT JAR.-A. Dickey, Middletown, Ohio. HORSE CAR POLE, ETC.-S. A. Otis, Boston, Mass. LIGHTING GAS, ETC.-E. Lindsley, Cleveland, Ohio. PRINTING PRESS.-W. M. Clark et al., Philadelphia, Pa. LOOM.-J. V. D. Reed, New York city. METALLIC PACKING.-W. H. Floyd, Boston, Mass. PULLEY, ETC.-G. G. Lobdell *et al.*, Wilmington, Del. PUMPING ENGINE.-G. F. Blake, Boston, Mass. PUTTING UP POWDERS, ETC.-C. R. Doane, Brooklyn, N. Y. REFRIGERATOR, ETC.-J. C. Mack, Brooklyn, N. Y. REFRIGERATOR CAR.-W. H. Klapp *et al.*, New York city. REFAGENATION OR. - W. DUNI (of San Francisco, Cal.), London, England. SHEET METAL.-C. D. Leet et al., Springfield, Mass. SUGAR MACHINERY.-F. O. Matthiessen et al., Irvington, N. Y. WINDING THREAD.-A. C. Carey, Malden, Mass.

# Recent American and Loreign Latents.

#### Notice to Patentees.

Inventors who are desirous of disposing of their patents would find it greatly to their advantage to have them illustrated in the Scientific Amer-We are prepared to get up first-class wood ENGRAVINGS of inven-ICAN. tions of merit, and publish them in the SCIENTIFIC AMERICAN on very reasonable terms.

We shall be pleased to make estimates as to cost of engravings on receipt of photographs, sketches, or copies of patents. After publication, the cuts become the property of the person ordering them, and will be found of value for circulars and for publication in other papers.

# NEW MISCELLANEOUS INVENTIONS.

#### IMPROVED DIE FOR CUTTING LEATHER.

Albert Warren, Jefferson, O .- This die, which is made of steel, of the shape of the article to be cut, and a little smaller at its cutting end than at the other, so that the pieces cut may pass through it freely, is fitted into a hole in a block of wood, so that its rear edge may be flush with the lower surface of the said block. A block of wood having a hole formed through it of the same shape as the cutter serves as a base support for the die. In using the device, it is laid upon a table or counter, over a hole in said table or counter, for the pieces to drop through. The material to be cut is then laid upon the edge of the die and is struck with a wooden mallet. With this construction the whole force of the blow is expended in making the cut, as the die does not have to be moved by the force of the blow.

### IMPROVED HARNESS PAD.

Miron V. Longsworth, Delphos, O.-The object of this invention is to improve the construction of the harness pad for which letters patent were granted to same inventor July 18, 1876, so as to make it stronger and more durable, and less liable to get out of order. The device consists in the crossbars upon the upper ends of the flanged pad plates to receive and hold the saddle strap.

#### IMPROVED ICE AX.

William H. Coleman, Salisbury Mills, N. Y.-This tool combines in a single instrument an ax for cutting ice, a pike for pushing it from place to place, and a hook for drawing it from the water.

## IMPROVED CRAYON FOR MARKING ON GLASS.

Bernard J. Clarke, New York city .- This crayon is adapted for marking on porcelain, glass, or other smooth surface; and it consists in a compo sition formed by mixing a pigment with melted beeswax, suet, and oil of cedar. The marks made may be readily erased by rubbing.

#### IMPROVED PHOTOGRAPHIC BURNISHER.

James H. Ferguson, Leavenworth, Kan.-This consists in the combination of a bedplate, to which a burnisher is attached, a feed roll, and an adjustable frame for supporting the feed roll over the burnisher. The object of the invention is to provide apparatus for burnlabing photographs, in which the burnisher may be heated without the common and annoying difficulty of the roll becoming moist from the condensation of the vapor from the lamp used.

#### IMPROVED STEAM TANK FOR COOKING FISH AND MEAT IN CANS.

Francis M. Warren, Portland, Oregon .- One end of this tank, which is of boiler iron, is left open, and around its edge is formed a rim having a groove to receive the edges of the door, and to it are pivoted a number of cams, which, when the door is in place, may be turned to press the said door to its seat steam tight. In the bottom of the tank is coiled a steam aid tank freely. To the bettern of the tank is attached e into th

When sulphides are subjected to the action of citric acid. sulphuretted hydrogen (H<sub>2</sub>S) is evolved; carbonates yield carbonic acid, CO<sub>2</sub>.

MESSRS. GEORGE P. ROWELL'S "AMERICAN NEWSPAPER DIRECTORY' sand pages. The brief history of newspapers for the year, contained in the preface, is not a particularly agreeable record for publishers, since, inone hundred and ninety. This is one result of the unsettled state of public affairs due to the election difficulties, and of the general retrenchment and economy practised by all classes. It should not be supposed that there is 8,427; so that newspaper readers need not fear any lack of their favorite literature. The only question is, and we confess the problem puzzles us as much as any one, where the material all comes from to fill so many sheets. Perhaps statistics, showing how many times a given article is published in them by the 8427 editors, would throw some light on the matter. The present "Newspaper Directory " is fully as good as its predecessors, possibly better, as in addition to the facts relating to newspapers, the editor has added useful information concerning the population, etc., of the localities where they are published. Of course the volume is invaluable to advertisers. Messrs, Rowell & Co, have removed from 41 Park Row to 10 Spruce street, New York city.

MESSRS. S. M. PETTENGILL & CO.'S "NEWSPAPER DIRECTORY AND AD-VERTISERS' HANDBOOK" for 1877 tells in compact and trustworthy manner about everything advertisers want to know concerning newspapers which they had best select for advertising their business. The work contains a

\* Feebly attacked. † The CO<sub>2</sub> evolved is derived from the citric acid.

track for the hand cars, upon which the cans are piled, to be run in and out upon.

#### IMPROVED TEN PIN BALL.

William Woods, Brooklyn, E. D., N. Y.-The object here is to improve the construction of ten pin balls, to prevent the balls from being chipped off or splintered around the finger holes, and to accurately balance the balls, so that they will roll perfectly true. To this end, metallic bushes are inserted in their finger holes.

## IMPROVED APPARATUS FOR DRYING HIDES.

James N. Duffy, Newark, N. J.-This invention furnishes an improved means for drying and stretching hides. It is so constructed that the hide may be stretched in any desired direction and to any desired extent, and thus dried without fold or wrinkle.

IMPROVED CAST IRON EXTERIOR COFFIN OR VAULT.

Robert Beachman, Lyons, N. Y .- This is an improved individual vault or grave which shall be airtight, so as to keep the coffin and body from the air, and thus preserve them. It protects the body and enables the vault and body to be removed.

#### IMPROVED BUTTON.

Benjamin Bailey, Yale, British Columbia.-This consists of a button with recess for attaching a spring steel hook of the suspenders, the button being secured by a hook-shaped shank, nickel plate, and concaved spring plate, to the waistband of the pants.