American Association for the Advancement of Science.

MET IN WASHINGTON IN THE LAST WEEK OF APRIL, 1854.

OUR PATENT SYSTEM.—The following is a condensed abstract of an able paper on our Patent System, by Dr. Gale, Chief Examiner in the Patent Office :—

The patent system gives to first inventors a monopoly of the profits of their inventions for fourteen years. Mere discovery does not entitle a man to a patent. Galvani could not have patented his great discovery, nor the discoverer of potassium his, though he might have patented his apparatus for making it. If a man learns a law or a principle of nature, he cannot get a patent for it; but he can patent his application of it to some useful or mechanical end. Our Patent System was not much calculated to promote science before its re-organization in 1836. Up to that time it was not very improperly said to be a "museum of rat-traps, churns, and quack medicines." There was no thorough examination of the claims presented for a patent; the oath of the inventor, as to originality, was taken—and that was about all. Now, a thorough examination of every article presented is gone through with, and the patent is only granted when there is entire satisfaction that no article of the sort has existed, or publication of the invention ever been made.—Our country is the only one where so thorough a system is carried out. And some of our patents now is of great value. It is a very small matter, indeed, if it is not worth $5,000; the medium ones are from $20,000 to $50,000 each, and many are not worth less than from $100,000 to $500,000 each. Even a valueless article, if a patent is obtained upon it, becomes valuable property, and hence avarice is continually besieging the Office for patents of unworthy inventions.

Our first patent system was started in 1790, and made to include under its objects hundreds of nostrums. In 1836 the present improved system was organized. The only medicine that has received a patent since its enactment was the *Letheon* of Drs. Jackson and Morton.

Seven-eighths of all the patents now granted are for mechanical and physical purposes; the other one-eighth are for chemical inventions. The applicant must describe his invention. A permanent record of this description is confidentially kept, and whether or not the application is granted, these described facts can be used.

The law of 1836 had been a long time in operation, of course, before it became of much use. But it begins to tell well upon the arts and sciences, the necessities and comforts of mankind. Up to 1836 there was not a grain or grass harvester in this or any other country. But the great wheat-fields of Illinois demanded too much hand labor at harvest time, and labor was too expensive for our people. Our necessity compelled invention to relieve us, and now we have grain, grass, and maize harvesters in general use. England has not many such assistants and substitutes for manual labor as we, and in all Continental Europe there are not over three or four kinds of harvesters in use, while we patent twenty modifications a year. In most European countries they use the same scythe now that they used one hundred years ago. We are perpetually varying our forms of the scythe to gain strength, power, and lightness. There is no branch of mechanical ingenuity that has not been revolutionized by the Patent Office. It makes fortunes for successful inventors, and furnishes cheaper implements to laborers, since the inventor is enabled to sell large numbers of his article at very small profits on each.

Alcohol without Re-Distillation.—At the Patent Office it is now customary to obtain pure alcohol from whisky without distillation or heat. The discovery was accidental. A gentleman had a quantity of whisky in a cask, five feet high. On drawing it off, he discovered that the upper part of it was much stronger than that near the bottom. The hint was taken; and now we prepare our alcohol by putting whisky into a tall column, and allowing it time for the heavier parts to subside, and we find pure alcohol at the top. This will prove an invaluable fact to manufacturers. [On this point we differ in opinion with the Doctor, and may take occasion to review it at an early date. —[ED. SCI. AM.]

Paper from Wood.—The great demand of paper outruns the supply of rags, even adding those that are imported for the manufacture of this article. The books say that a paper can be prepared from the wood of various trees, but except from two sources in England and one in France, and they not producing a good article, is has not ever been done until now. We are on the eve of successfully producing such. We have specimens of good writing paper—not as good as the best, for the means of working up the material are not what they will be—made of the fibers of hickory or the cotton poplar, of white pine and of cane-brake. The material is cut first of a proper length, then treated with dilute acids and alkalies, washed, broken between rollers, bleached, and thus prepared to be worked up. If under the microscope the "ultimate fibers" appear broken as sometimes happens from using too great mechanical violence, or if they are made too tender by too great strength of either acid or alkali, the specimen is faulty. These processes are mostly in the hands of practical unscientific men. The assistance of a practical scientific man at the mills would save much time, expense, and the mortification of experimenting to discover facts already well known to science. Indeed, the struggles of unsuccessful inventors would be much lessened in number and in their melancholy results, if inventors would study the general features of the sciences in whose details they generally are the most skilled.

Illuminating Materials.—Oil is scarce and dear, and very apt, in the present state of the market, to be sadly adulterated. Twenty-five years ago, it was not unfrequent that the windows in New York City were seen illuminated by means of spirits of turpentine. A Mr. Jennings first prepared for popular use a "burning fluid" composed of alcohol and turpentine spirits, and a fruitful demand for patents ever since has been for lamps, designing to render safe its use. When Washington City was first lighted with gas it was prepared from an oil of resin brought to us from abroad. But it was expensive and not the best material, and now our gas is made of coal.

Two years ago we heard much of a man down East who was "burning the atmosphere" for a light. The chemist whom he consulted showed that he was mistaken, but deduced from his facts a discovery that benzole would burn in the air, and give a beautiful light. But this article was scarce and costly. The demand, however, soon discovered the fact that it could be produced in large quantities, when bituminous coal is burnt at a low red heat. It is burned only in the form of a vapor.

Painting Materials.—White lead has long stood almost alone as a material for painting buildings, owing to the fact that very few substances have the property of dissolving in oil. In France it was discovered that the white oxyd of zinc has this property. But it was not used much before 1845. A difficulty here was to obtain from the zinc beds in New Jersey and Pennsylvania an article so unmixed with foreign matters as to answer as a substitute for the carbonate of lead. The demand, stimulated by the rewards always offered by the patent system, brings it out at last—a pure article and in plenty. The processes cannot as yet be made public.

Dr. Hare discussed the right of granting patents. He published, he said, in 1820-1, a paper showing that good lights could be obtained by burning alcohol, making the flame luminous by turpentine, but he advised against its use on account of its great danger. He remarked, in passing, that when the British, in the Last War, were about marching up to fire the Patent Office, old Dr. Thornton stepped up and reasoned with them. "Sure" said he, "you will not burn the depository of all their useful arts and the records of their inventions,"—and, to their credit be it spoken, they turned back at his plea.

KILLER WHALE—Lieut. Maury read an interesting paper on the *Killer-Whale.* He said that while they were studying, through their agents, the phenomena of winds and waves, they were constantly laying hands on subjects of exceeding interest, which were thrown in their way without their seeking. Captain Royes, a New-England whaleman, wrote him a letter describing the whales which he was acquainted with. There were sixteen kinds that he named, and one of them a strange fish, which the Lieutenant did not find named in any of the books. The Captain called him the "Killer Whale," and described him as thirty feet long, yielding about five barrels of oil, having sharp, strong teeth, and on the middle of the back a fin, very stout, and about four feet long. The Captain could not believe that this fin was of any service in swimming, but he thought it probably intended to defend him from the flukes of the right whale, in case of collision. For this "Killer" is an exceedingly pugnacious fellow. He attacks the right whale, seizing him by the throat, biting till the blood spouts, or till another "Killer" comes by and eats out the tongue of the tortured fish. This tongue of a right whale is an oily mass, weighing three or four tuns. The Captain sent a drawing of the "Killer," which was exhibited. The Captain, moreover, said that when he was second officer of the bark "Gem," of Sag Harbor, Captain Ludlow, of that ship, captured a "Killer," and carried home his jaw, and he did not doubt that if he wrote the Captain at Bridge Hampton, Long Island, he could get it. The Lieutenant had written, however, and received no answer; but wishing all possible light on the subject, he had written to his friend Captain Daniel McKenzie, inquiring if he had ever met with a "Killer." Captain McKenzie replied that he had seen thousands of them, but never saw one taken. He sent on drawings to the Lieutenant, sketched from memory, which strikingly corresponded with that of Captain Royes. It was customary, he said, for a shoal of "Killers" to attack a right whale, always plunging for the throat. Then others would snatch at his lips, tongue, and other parts about the mouth, the poor fish lying paralyzed with fear meanwhile, until they, fastening upon it, would sink it. Now, the "Killer" can stay much longer under water than a right whale. He had seen the "Killer" return to the surface after a long interval, but when they carried down a right whale in this way, he never saw the latter come up again.

A friend told him that he once pulled up to a whale so attacked and lanced it. The "Killers" thrust about in the greatest fury,—even attacked the boats, and more than once seizing the fish, carried it under water. The "Killer" attacks all kinds of whales, though most often the right whale; he scours the ocean from pole to pole, is in every sea, and all old whalemen have met him.

It was exceedingly curious, said Prof. Dewey, that an animal so well known to sailors, should be entirely unknown to naturalists.

WIND REGISTERING CLOCK.—Prof. Webster, of the Virginia Collegiate Institute, described a most ingenious yet marvellously simple instrument, for registering meteorological observations. It consisted of a common clock, the weight of which instead of running down within the case, runs over two pulleys and down by the side of a cylinder, placed vertically on its end. In the side of the weight a pencil was placed. The cylinder is surrounded with a sheet of clean paper, on which are ruled thirty-two vertical lines, to represent the different points of the compass, and twenty-four horizontal lines to indicate hours of the day. Through the cylinder runs a rod which connects above with a vane, and as the vane turns, the rod and the cylinder turn. Let the pencil in the weight be placed so near that the point presses upon the paper on the cylinder. Now if it is calm, the weight running down makes a perpendicular line on the paper, but if the wind shifts, the mark on the paper veers to right or left. If suddenly, it leaves a horizontal mark; if by degrees, it goes down diagonally.

COAL.—Prof. B. Silliman, Jr., noticed a peculiar variety of coal from Breckinridge Co., Ky. He had several specimens of it with him. The scenery of the country is shaped by the beds of this coal. It makes a terrace perfectly resisting to the changes going on all about it, and hence is found on the tops of hills only.—Struck on its side it resists hard strokes of the hammer, but struck at the end it splits easily. It is curiously elastic. It can be turned, carved, bored, and soils nothing. Expose other bituminous coals to the atmosphere and they are disintegrated. This never. There is no danger of spontaneous ignition. Organic remains—ponds beautifully marked—abound in its body. He merely suggested that it was formed by the extreme pressure together of large exogenous plants. Rub it, and electricity is at once developed. He had seen this property in but one kind besides. It burns like the best cannel coal. It contains on analysis an unprecedented amount of volatile matter,—from 50 to 64 per cent. But solvents remove none of it.

Prof. Hall remarked that cannel coal always has a bed of bituminous coal underlying it.—Was it so with this?

Prof. Silliman answered that there was a mere shale of the bituminous under this, about a foot thick.

Profs. Hall and Rogers thought cannel and bituminous coals not distinct coals, but the same varied only by the processes to which they had been subjected—they often seem to run into each other.

Prof. Hare could not understand how the coal having the largest amount of volatile oil should be uppermost.

Prof. Silliman replied that he supposed no heat necessary to its formation. We too often analyze substances as mere minerals. We should study more their organic composition.

He also exhibited specimens of coal, upon which he had experimented with reference to the question, Is Anthracite the Coke of Bituminous Coal? So far as they went, they answered the query in the affirmative.

EARTHQUAKES—Lieut. Gilliss read a paper, not prepared for the Association, but extracted from a voluminous report he had written on the Earthquakes of Chili. He described minutely the great Earthquake of April, 1851.—He went into the history of these convulsions as he had noted them in several years' residence in that quarter He disagreed with most writers on the subject, as to the barometric, hygrometric and thermometric changes that precede the shock of an Earthquake, but agreed with them that the Seasons have an influence.

(To be Continued.)

(For the Scientific American.)

Steam or Hot Vapor and the Vacuum.

In your interesting series of articles on Hydrostatics and Hydraulics in Vol. 6, it is said (page 128) that "boiling water cannot be drawn off by the syphon from one vessel to another, as the steam and the atmosphere are at equilibrium at the surface of the water." And it is added, "We have not seen this experiment mentioned in any work on Natural Philosophy." As far as your experiment related to the attempted syphoning of boiling water, it may have been an original one. You omitted, however, to show that hot water, some fifty or sixty degrees below the boiling point, can also not be drawn off.

It is no doubt well known to scientific men that liquids above a certain temperature cannot be pumped up, but the following brief information on the subject will be interesting to the general reader like myself. It is from "Chambers' Information "(Edinburgh edition of 1848). It is premised that whatever is true of the pump is also true of the syphon :—

"Only cold or moderately warm water can be lifted by a pump. If the water be above a certain temperature, about 150 degrees at the utmost, the sucker cannot form a perfect vacuum, because, in the attempt to do so, the water yields a steam or vapor which fills the space; in other words, by removing the atmospheric pressure by the piston, the water begins to vaporize as if about to boil. When a pump is made to operate upon hot water, it labors in vain to raise the liquid. This circumstance limits the heat of water injected at a high temperature, it must receive its heat between the pump and the boiler, and this is sometimes done by causing the tube from the pump to pass through a vessel of waste steam." B.