THE OIL WELL AT SOUTHBURY, CONN.

BY E. O. HOVEY.

Connecticut has had a peculiar history respecting mineral wealth. Many of the precious and baser metals have been found within her borders in sufficient quantities to lure men to spend thousands of dollars in mining and prospecting, but the deposits have always proved deceptive and unremunerative. Gold, silver, molybdenum, bismuth, nickel, arsenic, copper, iron, and lead, besides other minerals too numerous to mention, occur in many localities in the State; but, with the exception of the iron at Salisbury, Sharon, and Kent, the search for them has been disastrous to every one except the mineralogist, who has been well repaid for his labors.

Coal and oil also have received attention at the hands of eager enthusiasts. Many years ago a boring for coal was made with the diamond drill in the town of Durham, in the south central part of the State. When a depth of about 500 feet had been reached, and before the Triassic rocks had been pierced, the fruitless task was abandoned. Parts of the core from this boring may be found in many private collections in the State.

The occurrence of combustible black shales in the Pomperang Valley, in the west central part of Connecticut, led some enterprising individuals in 1831 to sink a shaft for coal about a mile west of the village of Southbury, New Haven County. Welsh miners were employed, who sank a shaft six feet square one hundred feet into the rock. At this depth drilling was begun, and carried on for some scores of feet deeper, with the crude apparatus of the day. The story goes that one morning, after a depth of 250 feet had been reached, the miners on descending the shaft encountered a quantity of gas, which ignited from their lamps and exploded. This accident and the increase of water stopped the work, no genuine coal having been found.

About twenty feet from this old shaft a company of Waterbury capitalists began to sink a well in September, 1888, being influenced by the legend of the old well, and by the presence of oil on the waters of a brook near by, to think that oil or gas might be struck by a deep boring. A complete plant from Bradford, Penn., with a twenty horse power engine, was put in, and with a gang of experienced oil well drillers from Bradford work was pushed forward rapidly. Black bituminous shales and red shales smelling of petroleum encouraged the company in their undertaking, and gave even the drillers sufficient faith in the success of the project to lead them to try to lease all the land in the vicinity. The oil fever, however, had struck the Southbury farmers, and no land could be hired. After a series of the mishaps common in the making of deep borings, the depth of 1,525 feet from the surface was attained. Last summer (1889) the job of reaming out the lower half of the well was undertaken; but after it had been partly done the tools were lost, and no work has been done since, though the company has not abandoned the idea of drilling below the 1,525 foot level.

The well is in the south central part of the Woodbury-Southbury outlier of the Connecticut Triassic area. An account of the geology of the region, with map, by Prof. W. M. Davis, of Harvard University, may be found in the "Seventh Annual Report of the United States Geological Survey," issued in 1889. The well intersects red and black shales, red sandstones and conglomerates, and two trap sheets, and at about 1,235 feet passes from the fragmental Triassic rocks into the highly crystalline gneisses and mica schists so widely distributed throughout New England. It is of interest to note that this is the first recorded instance of a boring which has pierced the Triassic rocks of this State.

At 1,250 feet free-milling gold and silver-bearing rock was struck, which assayed $10 worth of gold and $3 worth of silver to the ton, and the rock for ten feet above and twenty feet below this depth shows this amount or more of silver. If this rock occurs in considerable quantities, it would well repay the outlay necessary to mine it, and some of the oil well companies propose sinking a well with the diamond drill to obtain more definite knowledge of the strata and the occurrence of gold-bearing rock.

Speaking from geological premises, there is no chance whatever of obtaining either oil or gas from any boring here or elsewhere in Connecticut. The Triassic rocks are far above the strata which yield oil or gas in other States, while the crystalline rocks, which form the remainder of the State and are mostly of uncertain age, have been so highly metamorphosed that all volatile constituents like oil and gas—if ever there were any—have entirely disappeared from them.

A LOAN association in this city recently invited a number of persons to hear a speech by the celebrated English statesman Mr. Gladstone. It was a phonographic oration. That is to say, a phono-cylinder was produced, stated to have been just received from London, and when the cylinder was put through the phonograph machine a voice was heard, said to be Mr. Gladstone's. The message was short and rather dry. It related to self-help and thrift, both of which are very desirable qualities, according to Mr. Gladstone.

School of Industrial Art and Technical Design for Women.

At a reception held recently at the School of Industriol Art and Technical Design for Women, 134 Fifth Avenue, New York City, Miss Katherine Smith, a pupil and the "historian" of the school, read a paper which was in substance as follows:

When in the fall of 1881 a class of five was instructed by Mrs. Florence Elizabeth Cory in the principles of design and taught to apply them practically to industrial arts, then was first established the organization known as the "School of Industrial Art and Technical Design for Women." From that nucleus sprang the prosperous school which at present has upon its roll of membership 490 names, correspondent pupils inclusive, all of whom are striving to attain a degree of proficiency in their several departments of practical designing and industrial handicraft that will enable them to become self-supporting. Among these students are representatives of every State and Territory in the United States, several Canadian cities, and the Sandwich Islands. During the first two or three years lectures were given to the students by prominent artists and designers, but these were discontinued because the classes soon assumed such proportions that there was not room enough to accommodate all who wished to hear them.

Numerous invitations have been extended by manufacturers in New York and vicinity to visit their factories, and prizes amounting to several hundred dollars have been offered for various designs, and a variety of valuable art specimens presented.

Many designs have been made and sold to manufacturers since the establishment of the school. The work done has included carpets of all grades, oil cloths, linoleums, wall papers, stained glass, carved and inlaid wood panels, printed silks and silkalines, ribbons, upholstery fabrics, portieres, table linen of all kinds, calicoes, prints, awnings, lace, fan mounts, book covers, china, Christmas, Easter, and menu cards. Not only have orders have been filled for American manufacturers, but there have been sent to Leeds and York, England, patterns for ingrains, to Carlsbad, Austria, designs for china, to Dundee, Scotland, patterns for table linen and towel borders, to Japan, designs for printed and embroidered silks.

What the Best Judges Declare an Invention to Be.

The late Judge Hall, of the United States Circuit Court, says:

"An invention, in the sense of the patent law, means the finding out, the contriving, the creating, of something which did not exist and was not known before, and which can be made useful and advantageous in the pursuits of life, or which can add to the enjoyment of mankind.

"In other words, the thing patented must be new; and it must be useful to an appreciable extent, though the measure of that usefulness is not material. Any degree of utility appreciable by a jury is sufficient, upon the question of utility, to sustain a patent." (Conover *vs.* Roach, vol. iv. Fisher's Patent Cases, p. 16.)

And Judge Sawyer, late of the Supreme Court of the United States, defines invention in the following language:

"Invention is the work of the brain, and not of the hand. If the conception is practically complete, the artisan who gives it reflex and embodiment in a machine is no more the inventor than the tools with which he works. Both are instruments in the hands of him who sets them in motion and prescribes the work to be done. Mere mechanical skill can never rise to the sphere of invention. The latter involves higher thought, and brings into activity a higher faculty. Their domains are distinct. The line which separates them is sometimes difficult to trace; nevertheless, in the eye of the law, it always subsists. The mechanic may greatly aid the inventor, but cannot usurp his place." (Blandy *vs.* Griffith, vol. iii. Fisher's Patent Cases, p. 616.)

But while, as Judge Sawyer asserts, the boundary line between the domain of invention and mere mechanical skill is strictly drawn, yet some of the most valuable inventions have been so simple as to lead one to think that they were obvious, and did not rise to the dignity of invention.

Concerning the simplicity of invention, the late Judge Story, of the Supreme Court of the United States, remarks:

"The simplicity of an invention, so far as being an objection to it, may constitute its great excellence and value.

"Indeed, to produce a great result by very simple means, before unknown or unthought of, is not unfrequently the peculiar characteristic of the very highest class of minds." (Ryan *vs.* Goodwin, vol. i. Robb's Patent Cases, p. 729.)

It not infrequently happens that a sudden lucky thought gives a man a small (sometimes a large) fortune—the outgrowth of an important invention.

More than a quarter of a century ago, the late Judge Shipman of the United States Circuit Court of New York embodied the idea in one of his decisions:

"A subject matter to be patentable must require invention; but it is not necessarily the result of long and painful study, or embodied alone in complex mechanism. A single flash of thought may reveal to the mind of the inventor the new idea, and a frail and simple contrivance may embody it. Some inventions are the result of long and weary years of study and labor, pursued in the face of abortive experiments, baffled attempts, and finally reached after the severest struggles; while others are the fruit of a single happy thought." (Magic Ruffle Company vs. Douglas, vol. ii. Fisher's Patent Cases, p. 338.)

Other opinions, similar in purport, might be added; but these are sufficient to define what constitutes a patentable invention, which is important information for every inventor to know.

A Smokeless Powder.

A new explosive in the line of smokeless powder has recently been invented and patented by Sir Frederick A. Abel, of London, and Professor James Dewar, of Cambridge, England. The authors say:

The gelatinous explosives produced by combinations of nitro-cellulose and nitro-glycerine, with or without other ingredients, exert great disruptive force when they explode, and are, therefore, not suited for ammunition purposes.

The present invention relates to an improvement in the manufacture of such explosives whereby we moderate the force and rapidity of their explosion, giving it a propulsive instead of a disruptive character, so that they are adapted for ammunition purposes, the permanency of the compound without change being at the same time secured. For this purpose we combine tannin with the nitro-cellulose or nitro-glycerine, or with both in either of two ways. We either dissolve the nitro-cellulose—such as gun cotton or pyroxline—by any of the known solvents—such as acetone or acetic ether—and we add the tannin ingredient to the solution; or we first dissolve the tannin ingredient in the acetone or its analogue and use this solution as the medium of incorporation with the nitro-glycerine. We thus produce a compound which, when the solvent is eliminated by extraction with water or by evaporation, or both, is a tough, hard substance that can be granulated or otherwise treated for use as an explosive.

Instead of employing nitro-cellulose alone in forming the compound, as above described, we employ with it various proportions of nitro-glycerine, and we thus obtain a compound of soluble nitro-cellulose or of gun cotton (insoluble nitro-cellulose) with nitro-glycerine and tannin in a gelatinous condition, which may be rolled into sheets, drawn into wire, or otherwise treated for use as an explosive.

With the compounds produced as above described may be incorporated various proportions of oxidizing agents—such as nitrates of potassium, sodium, ammonium, and barium—and oxidizable substances—such as lamp black or graphite—and hydrocarbons—such as paraffine, vaseline, and naphthaline, cellulose, fatty oils, and fats or nitro-derivatives of hydrocarbons.

The proportion of tannin added for the purposes of our invention may be varied. In treating gun cotton alone we have found the proportion of ninety parts of gun cotton and ten parts of tannin to give good results.

In the case of a compound of gun cotton and nitro-glycerine we have employed the following proportions with advantage:

	Per cent.	Per cent.	Per cent.
Nitro-glycerine	55	35	40
Gun cotton	35	55	40
Tannin	10	10	20

Under the term "tannin" is to be understood any of the substances that are sold commercially under the name of "tannic acid." We prefer, however, to use gallotannic acid for the purpose of our invention.

Waste of Gas.

Chemist Martin, of the New York Board of Health, made an important statement before the Senate Investigating committee recently in relation to the comparative dangers of electric lighting and gas. He says that 10 per cent. of the gas manufactured in New York escapes from the mains into the earth and permeates the cellars and basements of the buildings and residences throughout the city. In addition to the injurious effect this has on the health of the city, it is also manifestly evident that there is great danger to life and property through explosions which must follow the introduction of gas into sewers and subways. The *Western Electrician* thinks one thousand million feet of gas contain more danger than the electric conductors in New York City, yet this is the amount, according to the same authority, but which is hard to believe, that leaked from the mains of the gas companies of this city last year.

DURATION OF LIFE IN NORWAY.—According to a recent work on longevity, published in Norway, the average duration of life in that country is 48·33 years for men, and 51·3 for women.