A NEWLY DISCOVERED WILD GOAT (*Capra dorcas*).

The discovery of a new world is greeted with enthusiasm by astronomers, but zoologists very seldom enjoy a similar pleasure, for the dominion of the animal world, especially that of the higher classes of animals, has been very thoroughly explored. So much the greater, therefore, was the sensation caused by the account of a hitherto unknown wild goat, which has recently circulated through the German press. The fact that the animal was from a European country, and not from some distant part of the world, added greatly to the interest taken in it.

"Polyaigos," *i. e.*, goat realm, was the ancient name for the home of this goat, which is the little island of Joura (Giura), one of the Sporades, lying to the north of Eubœa. The inaccessibility of the island was favorable to the increase of the animal. A person who visited the place later than 1848 reported that it was swarming with goats, but he could tell nothing of their species. Between 1850 and 1860 a young specimen came into the possession of the Austrian consul at Crete, but it was supposed to belong to the *Capra ægagrus* of Asia Minor. After that nothing was heard of the animal until the explorer E. v. Oertzen succeeded in catching a wild goat on the island of Joura. It was determined that it did not belong to the *Capra ægagrus*, and Dr. Reichenow named it *Capra dorcas*.

The creature is of remarkably strong build, is smaller than the common goat, and is characterized by a coat of dark brown, marked with black bands. His sinewy legs remind one of the chamois. The assertion that this wild goat attacked the hunter and threw him into a rocky ravine seems perfectly credible after one or two experiences with the specimen in the Berlin Zoological Garden. The two year old buck there gets on very well with his companions, but the sight of a man enrages him so that he rushes with great bounds toward the visitor, throwing himself with such force against the bars that they would long ago have been broken had not special care been taken to prevent such an accident. In spite of the failure of his daily attempts to attack great and small, he does not lose his pugnacious disposition, and a vain charge is made every time that a new comer appears, so that ladies and children often start back with cries of alarm.

Unfortunately, the wild goat of Joura is nearly extinct; and the improved firearms will soon exterminate him. It is, therefore, greatly desired, in the interest of science, that the slaughter shall end, and that steps shall be taken for the preservation of the species.—*Illustrirte Zeitung.*

A NEWLY DISCOVERED GOAT—CAPRA DORCAS—NOW IN THE ZOOLOGICAL GARDEN, BERLIN.

The Canon Wren.

E. M. HASBROUCK.

Who in wandering through the woods or along the banks of some rippling stream in early spring has not heard with delight the familiar note of some well known bird, or listened with eager ears for the faintest note that should proclaim the arrival of the first of a myriad of birds that in the course of a few weeks will swarm through the fields and forests? What lover of nature, upon hearing a song unfamiliar to the ear, has not felt a keen desire to trace it to its source, and labored long and patiently to find from whence it proceeded?

Long ago, when our country was comparatively new and naturalists few and far between, hundreds of birds whose notes had never been heard by men of science flitted through the woods, and whose songs, when heard for the first time, were a source of pleasure seldom equaled, and occasioned a feeling akin to idolatry.

Owing to the efforts of ornithologists, this state of affairs no longer exists. True, there is still much to be accomplished in the study of the singing of our birds; but to hear something comparatively new, something not constantly heard of and talked about, it is necessary to enter the more remote and isolate portions of the country, and to traverse the mountains and valleys seldom trodden by man. It is in such localities as this, in the southwestern part of the United States, that the canon wren (*Catherpes mexicanus conspersus*) is to be found. Here—no matter how lonely, darksome, or dreary the vale, no matter what dearth of life is otherwise to be found—the clear, melodious song of this bird breaks forth from the gloom and thrills the very soul of the listener as with something holy. This is entirely different from the song of any of our birds, and is as marvelous for its character as for its clearness and strength, consisting of a series of eight or ten notes, descending regularly as does the musical scale until the lowest note is reached, each clear and distinct, but prolonged so as to glide smoothly into the next.

I remember well the first time I heard it. I had been climbing the "Bee Rocks" near Meridian, Texas, and on reaching the summit paused a moment for breath and to rest. From a considerable elevation I looked across the Bosque valley to the hills on the opposite side, and along the river for a distance of twenty miles in either direction. The bed, owing to a three years' drought, was dry, save for a few stagnant pools of water, and the valley, although still of a sickly green, contained but little animal life.

In the air above circled countless numbers of vultures, while on the edge of the cliffs perched swarms too gorged to fly, but at times dispelling the monotony by shifting their location in long, awkward hops. The whole presented a scene similar to some of those described by Dante, and a more gloomy and desolate spot would be hard to find. While comparing it with a landscape viewed from a similar location in central New Hampshire, the wonderful note of the canon wren burst upon the air. It was repeated several times at intervals of about three minutes, when it was answered by another lower down on the cliff. Both sang for some moments, then all was hushed as before. That the rocks had now a new interest and had assumed a different aspect can be readily imagined. For some time I waited in vain for it to be repeated, when of a sudden it burst forth again, seemingly directly beneath me. Crawling to the edge and peering over the cliff, the author was discovered some distance below flitting from rock to rock, pausing occasionally to give utterance to its song, then resuming its occupation. To descend to a point about on a level with the bird and conceal myself was the work of a few moments. Presently, with a "chip" and flutter the little songster entered my retreat, visiting every nook and cranny, peering into every crack and crevice in search of insects. Yet it never for a moment lost sight of me. Coming at times to within a few feet of my hands, it would dart to the opposite side of the cavern and view me from another quarter. Whether it possessed that peculiar, hoarse, chattering note common to most of the family, I was at a loss to know until, by accident, I moved slightly, when, with a sudden movement, it dashed across the open space, plunged into the bushes, and descended gradually to the bottom of the valley, scolding to itself all the way. During the next half hour a dozen or more individuals were heard, and many others were undoubtedly in the vicinity. Descending now some fifty feet to a shelf which runs the entire length of the rocks, I followed it for some distance, and was pleased to note a number of the birds in question clinging to the walls, darting into the air, and seizing insects in the manner of the *Tyrannidæ*, disappearing from view for a time while they searched the interior of some dark retreat and appearing again often where least expected; on one occasion I observed one to enter an orifice in the rocks some twenty feet distant, and while watching closely for its return was amused to have it dart from a hole directly before my face. The bird was fully as surprised as myself and considerably more frightened, for it dashed around a neighboring bluff and went some distance down the cliffs.

This closed my experience with them until later in the season, when I again met a few in the vicinity of Comanche peak, in Hood county, and again a week later on Paluxy creek, but it was now late in the fall and their voice had lost much of its melody and richness. They are never, I believe, to be found at any great distance from the gorges and cliffs, which are their favorite haunts, and while the beauty of other localities is enriched by the songs of hundreds of musical little throats, it is reserved for the present species to lift in part and to cheer the gloom which forever overshadows some of Nature's mightiest and grandest works.

A New Flameless Explosive.

A new variety of "securite" has been prepared by Herr Schoeneweg, which is said to be flameless when exploded, and will, it is expected, be of especial value as a substitute for ordinary blasting powder and other explosives in fiery coal mines. It consists of nitrated hydrocarbons mixed with an oxidizing agent, such as chlorate of potash and some organic salt which renders the mixture flameless. The substance is not hygroscopic, and is of a bright yellow color, and can be kept for any length of time without undergoing any change. It cannot be exploded by a flame nor by a hot substance, but only by a detonating cap. Recent experiments at Hendon have proved that the new explosive fulfills the anticipations of the inventor, and we understand that the Flameless Explosives Company have undertaken to introduce it to the notice of mine owners and others to whom an explosive of this nature should be welcome. Its power is said to be equal to that of No. 1 dynamite, and it can be manufactured at a less cost. The organic salt which is added to the "securite" to produce this effect has also the property of rendering dynamite similarly flameless when mixed with it.

Fire Escape for School Buildings.

A novel system of fire escape for school buildings has been suggested by Captain Reagan, assistant chief of the Boston fire department, which upon its face looks as if it might prove of considerable practical value. His idea is to utilize the large yard area to be found about nearly every school house in Boston, and erect an ornamental iron tower a short distance from the building. This tower would contain a broad iron staircase leading from the top to the ground. From each floor of the school house a covered bridge would lead into the tower, and the door leading from the schoolroom to the bridge would be kept unlocked during school hours. The rooms on each floor would connect with each other, and in case of fire the scholars could have unobstructed access to the bridge. By such an arrangement, whenever a fire broke out there would always be an egress open, and even if matters became serious, the iron tower and bridges would remain unharmed. The plan appears to be perfectly feasible, and the expense would, it is said, not be much more than what is laid out on the present fire escapes. And we should think the same plan might be adopted for factories and other buildings where numbers of persons are employed on the different floors of the building.—*Fire and Water.*

A New Mineralogical Association.

On Monday evening, April 16, 1888, after the adjournment of the regular business of the New York Academy of Sciences, the members interested in mineralogy held a meeting for the purpose of establishing a section on mineralogy. The section will meet when enough interesting material presents itself to insure a full evening of business, and will publish all papers presented before the Mineralogical Club in the proceedings of the Academy. Mr. George F. Kunz was elected president, and Mr. J. H. Caswell secretary of the section. The newly elected president is to deliver a lecture on "Precious Stones during the Last Decade" before the Boston Society of Arts, at the Massachusetts Institute of Technology, on Thursday evening, April 26.

Alloys.

The first of a series of three lectures on the subject of "Alloys" was recently delivered by Professor W. Chandler Roberts-Austen, F.R.S., before the Society of Arts, London. In commencing his lecture Professor Roberts-Austen stated that there was a popular impression that chemists had consigned alloys to oblivion, but this view was only partly true, as chemists were now turning to metallurgists for help in explaining the constitution of the various organic compounds. For centuries the history of chemistry was the history of alloys, and much valuable information on the subject was contained in ancient works on chemistry. The art of separating metals from their ores was quickly followed by the knowledge of uniting metal with metal to form valuable compounds. In early times many metals had been used in a native state which were now only used in the form of alloys. Thus Greek vaseshad been discovered consisting of practically pure antimony. Nevertheless, Dr. Schliemann's discoveries had proved that this people were acquainted with alloys of copper and silver, gold and silver, and silver and lead, all artificially prepared. Throughout the middle ages the action of a base metal on a noble one had been considered as corrupting the latter; but in 1540 Muschenbrock had contested this view, and at the same time had shown that metals should be united in definite weights and not at random.

There were four old writers who took a prominent place for their researches on alloys. These were Reaumur, Muschenbrock, Gellart, and Achart. Reaumur's observations on steel read like those of a modern writer. He stated that steel only differed from iron in being more easily penetrated by sulphurs and salts, and on this he founded a theory of the hardening of steel which, if he had only known that it was carbon and not sulphurs and salts the steel contained, would have been nearly identical with some modern views on this subject. Gellart considered the relation of fluid metals to each other regarded as solvents. He knew that by a superior solvent property one metal could displace another. Muschenbrock examined the tenacity of alloys, and obtained the results agreeing remarkably well with modern observations. Achart studied the electric behavior of these substances, and showed that with regard to their conductivity for heat and electricity they must be ranged in the same order. The importance of employing pure metals in forming alloys whose behavior was to be studied was not recognized till about the middle of the eighteenth century. In 1860 we come to Mathiesson's works, which were of the greatest value. He studied the effect of uniting metals on their electrical resistance, and pointed out that his results could not be explained unless the metal in the alloy existed in a different condition to that which we were accustomed to in the free state.

Alloys could be formed in different ways. The most usual was by fusing the constituents; but they could also be produced by the compression of metallic powders and by electro deposition.

Taking a piece of tin, which, as they knew, could be bent, emitting at the same time its peculiar cry, a small percentage of arsenic would destroy this cry, and a slightly greater amount would give an alloy having properties differing from both its constituents, and very closely resembling zinc. Rubbing a little mercury round a bar of tin, the latter was rapidly penetrated, and could then be broken with ease.

Some metals evolved heat in uniting, while others absorbed it, producing cold. Of the first class of alloys were aluminum and copper, platinum and tin, bismuth and lead. All these metals, however, united at a comparatively elevated temperature, so that the experiment could only be carried out in a laboratory. Mercury and sodium, however, also gave out heat in uniting, and this experiment he could show them in the room. Cold was produced by mixing together equivalents of tin, bismuth, and lead, in the form of powder, and finally adding mercury to the mixture. The heat absorbed was so great that by placing the above mixture in a small flask, standing on a wetted board, and then adding mercury, the flask would be frozen to the board. The same fact, as to the production of cold, could also be demonstrated with a thermopile. The above results led to important conclusions, which he would deal with in the third lecture. The result was not the same if one took fusible metal, consisting of the same ingredients fused together, and acted on it with mercury. Cold indeed was produced in the latter case, but not to nearly the same extent, thus showing that molecular work had been done in the act of fusion.

Mr. Spring had shown that by compressing metallic powders the whole might be welded into one solid mass. This led to important results, as Mohr had shown that cohesion itself was but a kind of chemical affinity. The welding was due to the pressure simply, and not to the heat generated during the process, which was totally insufficient for the purpose.

Though metals might be united by fusion or compression, it did not therefore follow that they would remain united in cooling. The little mass of metal he held in his hand was once a uniform molten mass of lead and zinc, but on cooling these had separated out so completely that he could flatten out the lead at one corner or crush the zinc at the other. A similar separation took place if a molten mass of copper, lead, and antimony was allowed to cool in a cylindrical mould. There was another class of alloys. Depretz had shown that when an alloy of rhodium and lead was treated with nitric acid, a black residue was obtained, which, in a vacuum, would deflagrate or even explode with the evolution of nitrogen and oxide of nitrogen, just like certain organic substances.

Guthrie showed that alloys in solidifying threw off certain groups of their constituents, and that in the alloy which finally remained, and was the most fusible of the set, the metals were not in atomic proportions. This was important, as Mendelejeff regarded solutions as strict chemical combinations at temperatures higher than their dissociation temperatures, and showed that alcohol would form perfectly definite hydrates with water. He had there an alloy which greatly resembled ordinary cast iron in appearance, and it did in fact consist of iron, with only a small proportion of antimony, yet on filing it the particles removed by the tool would take fire in passing through the air, thus demonstrating the great effect of small quantities of metals on each other, perhaps the most interesting branch of metallurgy.

Nothing New.

It is an easy matter to prove that there is nothing new in the world, and it has come to be the fashion to belittle about every invention made, by showing that something in some respects like the thing invented has been known or dreamed of before. As a general thing, remarks the *American Machinist*, these rusty resemblances are matters of very little consequence. They go to show that some one has tried to accomplish a certain purpose and has failed, his failure resulting in no benefit to the public.

When an inventor brings out something that accomplishes a useful purpose not before accomplished, or does this better or more economically than it has been done, it is reasonably certain he has invented something in the value of which he has an interest. And this point is the one that is overlooked by those who declaim against the rights of inventors in favor of some one who tried to do something similar twenty years before. The very fact that the party who tried first did not succeed is fairly good evidence that he did not make the invention. All recent construction of patent law is in favor of sustaining the inventor who accomplishes something, as against the man who has tried and failed, even though the means used are very similar. And this is justice and common sense. The patent laws are presumably in the interest of the public, and the public is interested in the inventor to exactly the extent that it is benefited by him.

The same spirit that leads people to detract from the credit of others by unearthing old material things that were never of any practical utility, leads them to a good deal of useless trouble in the way of digging up obsolete ideas and expressions to show that some modern writer has, after all, told nothing new, although to ordinary readers it may be of great practical value. In this case, as in the case of the machine or other patented device, the man who gives the knowledge to those who are in search of it is the one who deserves praise. It makes but little difference whether he does this by adding something that was lacking, or by putting what is really complete in its way into such shape as will make it serviceable to others.

There are a hundred devices not patented nor patentable, used here and there for certain mechanical purposes, that a knowledge of would be of material advantage to others. But those who could make this knowledge known are very frequently hindered from doing so because there is in all probability, somewhere, a man who stands ready to affirm that he has seen and used the same device. The knowledge of many a good thing is, kept from being made common because those who possess it are reasonably certain that it is not absolutely new. The man who has "seen it before" is not always a public benefactor, although he may be a very observing person.

The New Explosive "Hellhoffite."

The safe working of mineral property has for nearly twenty years been an anxious care to the legislature, to specialists, and to the general public in this country, and at present there still remain unsolved two mining problems of the greatest importance. A perfectly efficient and safe miner's lamp has yet to be provided, and colliery managers are still far from unanimous in their approval of an effective and at the same time harmless substitute for gunpowder and dynamite as explosive forces. The lamp question has continuously been the object of scientific application, but it is only recently that inventive genius has engaged itself in the task of modifying the process of breaking down minerals by means of dangerous explosives. Progress in this work has been marked by the water cartridge, gelatinous cartridge, securite, tonite, a variety of mechanical coal getters, and other more or less practically useful productions. "Hellhoffite," which is one of the latest additions to the list, hails from the Continent, and is said to be a harmless explosive. Hellhoffite is a red and rather caustic liquid, and is formed by a combination of the nitro-products of tar oils with nitric acid. It may also be obtained as a solid, this state being arrived at through absorption of the liquid by "kieselguhr"—fossil earth.

The cartridges which contain the explosive are made, for light charges, of refined lead, and these may be driven into the blast holes under pressure, are capable of filling up unevenly drilled holes, and can sustain deformations without their contents being affected. The explosive is fired by means of strong caps, primed with fulminate of mercury, inserted into small lead tubes tightly screwed in the cartridges, and these need not be fitted on until just before firing. Numerous experiments have been made at various Continental mining centers under diverse conditions with this explosive, and have uniformly resulted in a clear demonstration of the great force it exerts and of the perfect safety with which it may be used. From a tabulated statement contained in the final report of the Prussian royal commission on explosions in mines, it appears that a long series of experiments with hellhoffite were conducted in the drift of a mine, where in each case the percentage of fire damp varied. In one instance it amounted to 10 per cent, and when coal dust as fine as flour was strewed for a distance of 10 m., no flame whatever appeared. According to the same authority, liquid hellhoffite is 70 per cent more powerful than guhr-dynamite, and 30 per cent more than liquid nitroglycerine; and in the opinion of the imperial and royal mining department of Pribram, it has over 38 per cent more breaking power than Nobel's gelatine dynamite No. 1. The following is culled from an official report of the royal Hungarian mining department of Schemnitz:

"A rail of the narrow gauge Schemnitz line was laid free upon a grass plot, and a 100 gramme hellhoffite cartridge so placed upon the rail—totally uncovered—as to be located between flange and foot. The cartridge being fired by an electric fuse, the whole foot of the rail was torn away for a length of 15 cm., and hurled to a distance of over 50 m., the surfaces of the fragments showing initial signs of fusion. A 105 gramme dynamite cartridge, placed in the same manner upon a similar rail, exploded when fired without showing any vestige of destruction."

When we add that the products of combustion remaining after the explosion of the hellhoffite are only characterized by the smell of the burnt fuse, and are neither dangerous nor disagreeable; that the price of this explosive, including the filling of the cartridges and the packing, is less than that of dynamite; and that when used in a pit the tendency of its breaking power is rather to rift than to shatter, it is sufficiently clear that the explosive to which we now direct attention is one which will make its influence felt in the mining world.—*Industries.*

Ivy for Walls.

In order to expedite the growth of ivy, the ground, previously to planting, should be trenched two feet deep, and be enriched with decomposed farm yard manure, vegetable refuse, and the ashes of burnt rubbish of any kind. The plants should be healthy and well rooted when planted, and be watered as required in dry weather. No other evergreen climbing plant is so good for covering a wall as ivy, and the old Irish ivy (Hedera helix canariensis) is not surpassed for general usefulness. Many other ivies, however, are well worthy of attention. Hedera dentata is the largest-leaved ivy in cultivation. It has a very long leaf stalk, and its hard, leathery foliage stands out boldly and effectively. H. Rægneriana is another bold and effective kind, with magnificent, large, glossy, heart-shaped leaves. H. latifolia maculata is a handsome, marble foliaged variety of canariensis. They are both of very free growth. H. azorica, sagittæfolia, and taurica are also very useful. The last named has much divided, small, and neat, distinct leaves. There are also several other very pretty variegated sorts, such as H. aurea, argentea, and elegantissima, which do not grow quite so fast as the foregoing, but are indispensable if a collection is aimed at, and are very useful for covering buttresses and small prominent positions, the more robust growers being planted to cover the broadest spaces. The green varieties of ivy delight in rich soil, which induces rapid growth, but to the golden and other variegated sorts rich soil is detrimental, for if forced into exuberant growth they are apt to sport from their variegation.—*Garden Work.*

The Keely Motor in Court.

Another act in the Keely motor farce was opened by Judge Finletter, on April 7, 1888, in the Court of Common Pleas of Philadelphia, requiring John W. Keely to exhibit, within 30 days, to experts appointed by the court, his "motor" inventions. The examination is for a special purpose, to ascertain whether he now has departed from an invention alleged to have been assigned, in 1869, to the plaintiff in the action, Mr. Bennett C. Wilson.

The First Appropriation of Congress for the Telegraph.

From a sketch of "American Inventors of the Telegraph," with special reference to the services of Alfred Vail, in the April *Century*, profusely illustrated with portraits and diagrams, the *Railway Review* quotes as follows: This was a period of discouragement and depression for the proprietors of the telegraph, scarcely relieved by a ray of light from any source. At the time, there seemed little hope that Congress would even grant the desired appropriation. The session of 1839–40 was on the eve of the most exciting and disgraceful presidential campaign that the country had ever known, and, as in later days, the members were far too much interested in legislation which would give them some imaginary advantage over their political opponents to pay attention to measures affecting the real welfare of their constituents and of the country. In December, 1842, Morse was persuaded to make one more application to Congress. The committee on commerce again recommended an appropriation of $30,000 in aid of the enterprise. The bill passed the House by a close vote, and only after a discussion which, as reported in the *Congressional Globe*, reflects scant credit upon the patriotism, to say nothing of the intelligence, of some of the participants. In the last hour of the session, March 3, 1843, the bill passed the Senate, and was signed by the President. Morse, writing to a friend in after years, says:

"This was the turning point in the history of the telegraph. My personal funds were reduced to the fraction of a dollar; and had the passage of the bill failed from any cause, there would have been little prospect of another attempt on my part to introduce to the world any new invention."

On March 4, Morse wrote to Vail the most hopeful letter he had penned in many years:

"You will be glad to learn, doubtless, that my bill has passed the Senate without a division and without opposition, so that now the telegraphic enterprise begins to look bright. I shall want to see you in New York after my return, which will probably be the latter part of next week. I have other letters to write, so excuse the shortness of this, which, if short, is sweet at least. My kind regards to your father, mother, brothers, sisters, and wife. The whole delegation of your State, without exception, deserve the highest gratitude of us all."

On March 31 Morse tendered Vail an appointment as assistant and superintendent of the machinery department of the telegraph to be constructed between Washington and Baltimore under the government appropriation, which was at once accepted, Vail immediately entering upon his duties with characteristic energy and industry. From this time forward the condition of the work is minutely detailed in his diary, and from this we gather much information of interest in respect to the subsequent progress of the work. On April 13 he suggested to Morse the trial of two or more circuits from one battery. The experiment was successful, and the result proved to be one of the utmost importance when the telegraph system became more widely extended.

A SUBURBAN RESIDENCE.

We publish an admirably planned and picturesque design of a suburban residence, by Mr. Wm. H. Beers, architect, New York. The house has been designed to occupy a corner lot, with a frontage of one hundred feet on the main street and two hundred on the side street, giving ample room for a stable in the rear of the lot. The house has an extreme frontage of 55 feet by 65 feet in depth.

The exterior of the house on first story is finished with clapboards and trimmed with corner boards, belt courses, etc., as shown on the drawing, and over each window is placed a swinging transom glazed with stained glass. These transoms are very pretty in their interior effect, and also furnish an excellent means for ventilation, when opened, in connection with the open fireplaces in each room. The second story is carried out in the "Old English" half-timbered style, with the panels filled in with round cut shingles. On the front there is a gable extending half the width of the house, with a very effective group of windows in same. The panels in this gable are filled with shingles, carved woodwork, rope twisted in artistic designs, secured to the wood, and finished in bronze, producing an excellent effect.*

A TWENTY THOUSAND DOLLAR COUNTRY HOUSE.

Keep's Tests for Foundry Iron.

A paper has recently been communicated to the South Staffordshire Institute of Iron and Steel Works Managers by Prof. T. Turner, of Mason College, Birmingham, giving a full account of the methods of testing cast iron devised by W. J. Keep, of the Michigan Stove Company, Detroit, an abstract of which is given in *Engineering*. These tests have been adopted by a number of important American firms who have to do with the buying and selling of foundry iron, and it is sought to introduce them into this country, for the purpose of providing a uniform standard, which has already been approved by a lengthened experience in America. When the tests are carried out in their entirety, 15 lb. of metal are melted in a plumbago crucible in a fire-brick furnace, driven by a blast at a pressure of 2½ oz. per square inch. Three sets of test bars are run from each melting. One bar is ½ in. square and is cast with the ends against a chill exactly 12⅛ in. apart. Another bar is cast with this, and is run from the same gate. It is 1 in. wide and 1-10 in. thick and is run against chills in the same way as the square bar. When the bars have been trimmed and both bars and chills have attained the same temperature, the shrinkage is measured by inserting a graduated wedge between the end of each bar and its chill. A third bar is called the fluid strip. The pattern of this is 1 in. wide, 12 in. long, and 6-100 in. in thickness. This is run from the end and is poured first. The strip rarely runs full, and its length in inches is taken as a measure of the fluidity of the metal. The fourth bar is called the crook strip. It is 12 in. long, 1 in. wide, and 86-1000 in. in thickness. On the center of one side there is a rib 412-1000 in. high, 1-5 in. wide at the base, and 1-10 in. wide at the top. The unequal shrinkage of the thin flat strip and of the taper rib causes a slight curve in the test piece. This, when measured, affords valuable information as to the properties of the iron, and is called the "crook." The first and second bars are tested for transverse strength and resistance to impact. The first test is made by a gradually applied weight, the deflection being measured at the same time. The resistance test is made by subjecting the bar to a series of blows from a 25 lb. weight until it breaks, the fall being at first ½ in., and increasing ⅛ in. at a time. An arbitrary scale has been constructed giving a value in pounds avoirdupois on an assumed value for a foot pound. After these tests have been made the depth of chill is determined, and the grain of the fracture is observed by means of a pair of lenses. The hardness of the metal is finally tested by means of Turner's machine, in which a polished surface is set under a diamond of a standard cut, and the diamond is weighted until it produces a scratch similar to a standard scratch. They are made by the Dunkirk Manufacturing Company, of Dunkirk, N. Y., and the price of the complete set is about $350. These tests have been in regular use for upward of two years at the Michigan Stove Company's works, where about 70 tons of iron are daily cast into thin stove plates.

AN American manufacturer of sugar coated pills added to the attractions of an exhibit of his product in London an ingenious piece of mechanism, which might have been intended to represent the pharmacist of the future. It was in the form of a cabinet provided with a series of knobs or buttons, each inscribed with the name of some malady for which a remedy might be asked. The customer puts a coin into a slit and presses the button calling for the remedy he requires, when immediately a drawer flies out containing the article sought. This automatic dispenser of course makes no mistakes. If the customer accidentally presses the wrong button, he alone is responsible for the error. Is this really what we are coming to?

* A description of the house, with a number of other views showing the bracketed gable, oriel bay window, and other ornamental features of the house, appeared in the June, 1887, number of the ARCHITECTS AND BUILDERS EDITION OF THE SCIENTIFIC AMERICAN, copies of which may be had at this office and of news agents. Price, 25 cents.