

silicious pig iron, lime is first added to combine with the silica formed, and thus slag is removed, after which carbonate of soda is added and a second period of the blow takes place, the phosphoric acid combining with the soda as above. It is stated that vanadium to the value of several millions of francs is lost every year in the slags at Creusot, and that this could be separated from the first extract of the soda slags by cold water.

THOROUGHbred CATTLE.

During the decade ending 1880, the number of milch cows on farms in the United States increased 39 per cent, and then reached twelve and a half millions. A large portion of these cattle, except in a portion of the South and of the far West, had been greatly improved by the intermixture of thoroughbred blood from the choicest cattle of Europe, such as the Jersey, Alderney, Hereford, and more recently the Holstein, which are said to combine the excellences of both the Shorthorns and the Ayrshires. The importance of giving close attention to careful breeding has long been widely appreciated among intelligent farmers, in order to the development of sound constitution and symmetrical form, aptitude to fatten, quiet temper, and large milk yielding power; and the group of cattle herewith shown forms a picture which might well delight the eyes of any farmer or dairyman.

They are owned by Messrs. Buchanan Bros., of Chicago, who give us the following descriptions and explanations for publication. The young bull "Duke,"

of Niagara, 2030 H. H. B., was calved July 2, 1883, sire "Captain" (546), dam "Buda" (1140). "Captain" is a son of the famous cow "Echo" (121), and "Buda" was from "Morning Glory" by "Mahomet." He is a fine, thrifty fellow, and bids fair to make one of the handsomest Holstein bulls in America. The heifers are both imported yearlings of good size and form. "Zee" (5738 H. H. B.) on the right, is a remarkably handsome animal. Her dam has a milk record of fifty-eight pounds of milk a day, as a five year old. Both her sire and dam are registered in the Netherland Herd Book. "Duskje" (5993 H. H. B.), on the left, is very fine in form. Her dam also has a fifty-

eight pound record. The entire herd now contains about sixty head of pure bred Holsteins, of which the above are said to be but fair samples.

Transformations of Paper.

The uses of paper, outside of its ordinary commercial purposes for printing, writing, and wrapping, are constantly increasing; its great cheapness suggesting its employment for widely differing purposes. Some of its latest uses, in view of its properties, as generally known, seem very curious, but are not more so than its employment as car wheels, in which it has been very successful. It is in fact one of the most adaptable products of the hand of man. One of the most remarkable uses is the manufacture of zylonite, which can be made in imitation of horn, rubber, tortoise shell, amber, and glass. Zylonite may be adapted to a wide variety of uses, but one of its most valuable is an imitation glass for cathedral windows.

The zylonite is much less brittle than either horn or ivory, and much more flexible. As imitation tortoise shell it can hardly be distinguished from the genuine article. In the manufacture of zylonite, plain white tissue paper, made from cotton or cotton and linen rags, is taken and first treated to a bath of sulphuric and other acids, in which it undergoes a chemical change. The next process is the washing of the paper to remove the acids, and it is then treated to another preparation of alcohol and camphor. Its appearance by this time is very much like parchment, and it can be worked up into plates of any thickness, and made

perfectly transparent, or can be dyed all the brilliant colors that can be given to silk.

SHEETS AND SHAMS.

A widely different use from the above is in the manufacture of counterpanes and pillow shams. These articles are composed of two sheets of No. 1 Manila paper. To hold the sheets together, and to strengthen the fabric, small gummed twine is used at distances of three or four inches. The sheets are also hemmed about the edges so as to prevent tearing. Handsome designs may be and generally are printed upon the upper surfaces of the shams and counterpanes. The articles are very neat, serviceable, and cheap. All wrinkles can be removed by hot flatirons. As the paper will prevent the escape of heat about as well as a woolen blanket, it can be made a very serviceable article of bed clothing, as it can be left upon the bed if desired.

Though paper pulp is not strictly paper, a glance at some of its uses is properly within the scope of this article. A recent use for which a patent has been granted is in the manufacture of sheathing and roofing papers. The sheathing paper is made from a pulp of spent tan bark, meadow hay, and mill waste as a center, with a layer of pulp on either side, composed of cotton or linen rags, waste papers, or a mixture of similar materials. The roofing paper has the same middle, but the covering is a pulp composed of satinnet and colored rags, shoddy, and straw. Both of these articles are said to be excellent for the purpose intended.

PAPER PULP FABRIC.

Perhaps the most important of the recent inventions

The fabric is afterward dried, and is then ready for use. Before being passed through the rolls and covered with the pulp, the wire cloth is waterproofed or not as desired.

The fabric looks exactly like paper of the same texture and quality. The surface of the fabric may be finished by painting, varnishing, etc., or by treating it with a fireproofing or waterproofing compound, or by covering it with finished paper, etc. As the fabric is a continuous sheet, pieces of the sheets can be easily cut into the proper shape for any use or for any article, especially those that can be formed without seam. The parts can be easily seamed together, however, if necessary, by paste or cement as in ordinary paper, and the joints may be united as perfectly as paper, as all the joints on the outer surface are of pulp.—*Com. Bulletin.*

A Rare Visitor.

The seventeen-year locust is making its appearance in great numbers in various parts of the country, though very few have been seen in Philadelphia as yet, says the *Inquirer*. For a long time after this insect had received its popular name, scientists were inclined to laugh at the theory that its visits were repeated at seventeen year intervals, but further study showed the accuracy of the unscientific observers. The harvest fly, as it is properly called—for it is not a locust at all—appears irregularly in different sections, but only once in seventeen years in the same section, and this because seventeen years are required to develop the perfect insect from the egg. There is another kind

which completes its period of development in thirteen years, but it is comparatively rare. The "locust" is not injurious, except to the small twigs of trees. It eats nothing while in its winged state, but the female punctures the twigs of various kinds of trees and lays her eggs in the wound, after which the twig usually dies, thus disfiguring and possibly injuring the tree; though in most instances the pruning thus effected is beneficial rather than the reverse. In about six weeks the eggs hatch out, and the young insects, in their grub or larval state, drop to the earth, into which they immediately burrow until they find a root. They attach themselves to this, and there remain

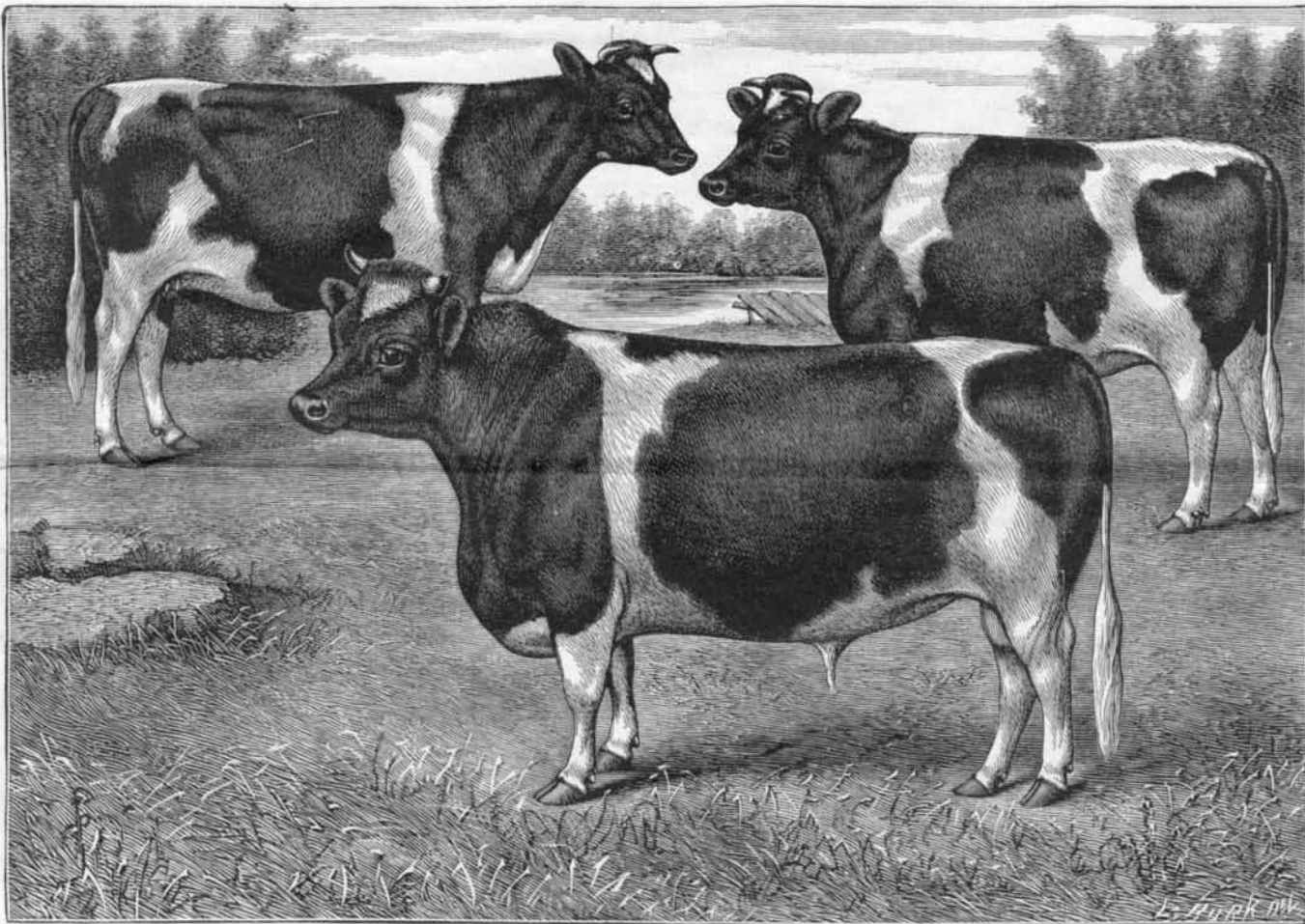
for seventeen years, living on the sap of the root, which they suck up through a tube something like that of the mosquito. When the appointed time arrives, they burrow upward again, and crawl up some tree or wall to the height of a few feet from the earth, where they shed their chrysalis coats and become perfect insects; after which their life is a short and merry one. They sing by night and fly about by day, but perish in a week or two, having run their natural course.

Designs for Carpets.

In the School of Designs, in South Kensington, there are several quotations which are regarded as axiomatic, and they unequivocally direct the efforts of the pupils. The following is the rule upon carpet design:

1. The surface of a carpet, serving as a ground to support all objects, should be quiet and negative, without strong contrast of either forms or colors.
2. The leading forms should be so disposed as to distribute the pattern over the whole floor, not pronounced either in the direction of breadth or length, all "up and down" treatments being erroneous.
3. The decorative forms should be flat, without shadow or relief, whether derived from ornament or direct from flowers or foliage.
4. In color the general ground should be negative, low in tone, and inclining to the tertiary hues.

In packing bottles in cases for transportation, India rubber bands slipped over the bottles will prevent breakage, and save considerable in packing material.



A GROUP OF HOLSTEIN CATTLE.

or applications of paper pulp is in the manufacture of paper pulp fabric. This material is designed for articles which require the characteristics of paper and, at the same time, much more strength than paper alone possesses. Paper pulp fabric in the past has been made by securing sheets of finished paper to sheet metal by means of a cement or an adhesive of some kind. This fabric was necessarily somewhat limited in area, as the area of the metal sheets were limited.

The latest paper pulp material is made in continuous webs or lengths in all desired widths. The fabric is composed of a wire cloth, of a desired fineness or coarseness, covered with paper pulp. It thus possesses all the strength of metal and all the flexibility, softness, and smoothness of paper. The continuous webs of paper pulp are combined with the continuous web of wire cloth, so that the pulp is forced through the meshes of the wire cloth, completely filling them and at the same time completely covering the wire.

METHODS OF MANUFACTURE.

The pulp is manufactured by an ordinary paper making machine, so as to deliver two independent and continuous sheets of paper pulp at certain points, from which the webs or continuous sheets are fed into suitable pressure rollers. A roll of wire cloth is placed in the line of feed near the pressure rollers and is fed into them at the same time, and between the two continuous sheets of paper pulp. The rollers press the three webs together, and in the operation the two webs of paper pulp fill the meshes of the wire cloth as well as completely enveloping it.