**Snowballing in July.**

A very novel spectacle was witnessed in New York city, last month, at Morrisania, where people were snowballing each other with genuine fresh snow, pressing it into big round balls, pelting each other with it, and slapping their half-frozen fingers on their thighs to restore circulation to the benumbed members. It was, of course, artificial snow, and made by the working of an ice machine just set going in J. & L. F. Kuntz's brewery.

The machinery, as usual in all ice machines of this class, consists of three parts—a compressing pump, a condenser, and a refrigerator. Aqua ammonia of the highest procurable strength, is poured into a small still and heated until the ammoniacal gas is all driven off into the condenser. There, by the compressing pump, it is liquefied, at a pressure of six and a half atmospheres in a temperature of 50° Fah. The liquid gas is passed thence, through small tubing, into the refrigerator, which is a separate close chamber about 14 feet square; this chamber is the freezing box for the whole brewery. The refrigerator itself is a voluminous machine, consisting of eight coils, each 300 feet in length of continuous welded pipe, the whole forming a large cylinder 9½ feet in diameter. In these coils of pipe the gas, liquefied under pressure, reassumes its gaseous form, and in so doing takes up all heat about it. The cylinder is kept whirling swiftly, partly to promote the spread and expansion of the liquid, but more to enable a lot of huge brushes to sweep off constantly the snow which is continually forming from the atmosphere upon these pipes. A cart load of snow is thus swept off every day. But it is not nice snow. It is good enough for snowballs, but there its use stops, for the air from which it has been formed has been sucked up by a powerful draught from the depths of the lowest cellars, and every sour smell or taint in the atmosphere is transferred to this snow. The air driven down to replace that thus drawn up is not only freezingly cold, but is dry and pure, so that through all the vaults the atmosphere seems like that of the country on a winter's morning. After going through this great mass of tubing, the gas returns to the outer chamber, bearing with it all the heat it has taken up; and to get rid of this it is sent through 1,200 feet of piping, upon which water falls in a spray, and a great fan keeps up a constant cooling current of air. After that it is fit to pass into the condenser, and so around again. None is wasted; none escapes. Yet it maintains a temperature of 3° Reaumur (say about 38° Fah.) throughout three vaults, each 80 by 50 feet, with an average height of 11 feet, and even greater cold could readily be obtained were it desirable. The use of this apparatus enables the actual storage at one time of 50,000 barrels of beer.

It is claimed for the invention that it will save brewers a vast sum by diminishing the consumption of ice, and doing away with the necessity of constructing underground vaults of large dimensions.—*Manufacturer and Builder.*

**LACE FAN.**

The fan shown on this page is of French manufacture. The face is made of the finest lace, the pattern being designed and worked expressly for this purpose. Nothing more delicate and fairy-like could be imagined, nor could the most capricious beauty demand anything more exquisite.

**Ozokerite, or Mineral Wax.**

We make the following extracts from a letter, which appeared in the *Foxburg Gazette*, written by Mr. E. M. Grant, who has recently returned from a visit to the various oil-fields of Europe:

The production of oil in the Eastern Galicia oil fields is very limited at present in amount. The wells are mostly situated near Boryslaw, though there is one well south of Boryslaw about 45 miles, that is doing 8 to 10 barrels per day of nice green oil.

The wax fields of Eastern Galicia attract the most attention. This earth wax, or ozokerite, as it is called, is neither more nor less than oil that has been evaporated, leaving the residuum in a solid state, so that it is dug out with picks and shovels, and is about the consistency of common clay. It is very valuable, being worth from 7 to 8 cents a pound.

The shafts are from 350 to 600 feet deep and very close together, so close that, on the piece of land where this wax is found at Boryslaw, containing not over fifty acres, there are 10,000 shafts.

The walls of these shafts are curbed with timbers, but at the depth to which they go they are very thin, so that scarcely a day passes but the walls cave in, breaking the timbers like pipe stems, and burying several human beings beneath the great mass of earth. This thing occurs so frequently, that from four to six persons per week are killed in this manner.

Great fortunes have been accumulated by a few of the Jews who owned the land where the wax was found. The vein is about 16 inches thick, and the wax is carried out in buckets. Twelve thousand men live on that fifty acres of land, how, nobody knows. The wax is refined and made into candles. This being a great Catholic country, and a holiday occurring nearly every other day, candles are in great demand. Our party, consisting of Jas. H. Clark, John Huntington, James Carrigan, and Worthy Clark, of Cleveland, and Wm. L. Lay, of Oil City, took breakfast with a Polish gentleman at Boboka, and the conversation turning on earth wax, Mr. Lay said that there was a mountain of it in Utah, at which the old Polish gentleman exclaimed, "My God! the Lord is with America again! He gives Poland sixteen inches of earth wax, but He gave America a whole mountain." They all like America and Americans, most of them being republicans at heart. The wax field is fully developed and nearly exhausted, unless they should find something new.

In Hungary there is no oil of any account being produced, but there are surface shows all along the range of mountains on the Hungarian side, and some day it will be developed. The government will assist any one who really means business and desires to develop the country.

**ENGINEERING INVENTIONS.**

Mr. Cyrus B. Cook, of Cynthiana, Ky., has invented an improved combined governor and self-adjusting cut-off, which combines the governor and slide valve of an engine so as to cause the governor to automatically adjust the range of movement of the valve, and thus shorten or lengthen the cut-off automatically. The invention consists in connecting the valve and the governor by a hollow rock shaft, having a second central shaft within. The two shafts are coupled for independent movement, and are combined with an adjustable crank mechanism and a trip mechanism, operated directly by the governor, so that the governor sets in operation the trip mechanism, and allows the engine to act through the independent shafts to alter the throw of the valve rod.

**EXQUISITE LACE FAN.**

An improvement in water works has been patented by Mr. Paul B. Perkins, of Geneseo, Ill. The object of this invention is to supply water for domestic, manufacturing, and other purposes in cities and towns, and at the same time to furnish the requisite quantity of water under any desired pressure for extinguishing fires wherever the distribution pipes may be extended, by means of stationary pumping machinery discharging the water from its supply source into and through an air tight compression storage reservoir that is provided with the necessary pipes, valves, and fire hydrants, all connected with the town or city mains.

Mr. McWilliam F. Margach, of Meadville, Pa., has devised an improved balance valve, the object of which is to relieve the balancing device from contact with the top of the steam chest as soon as the steam is shut off, and to prevent the formation of a vacuum in the cylinder. It consists of a disk placed on top of the slide valve, and encircled by a ring, which, by the pressure of the steam underneath it, is forced up against the under side of the top of the steam chest, so as to shut off from the pressure of the steam the area on the upper side of the valve inclosed by it, but which is adapted to fall back from contact with the top as soon as the steam is shut off.

Messrs. Adam Moessinger and William Heathcote, of Glen Rock, Pa., have patented an improved gate for turbine water wheels. The invention consists in an arrangement of a circular or conical cap with slotted flanges operated by a rack and pinion, the flange covering the upper openings of the water course, and of a slotted cylindrical ring operated by an eccentric, which covers the lower openings of the water course.

An improved rotary valve and seat has been patented by Mr. Edward L. Watkins, of San Antonio, Texas. The invention consists in combining, with a valve seat having four ports, a rotary valve having a curved opening and recess. When the valve is driven at a uniform speed, the steam will be cut off at about half stroke, but, if desired, it may be so geared as to be driven at a variable speed, and arranged to cut off steam at any desired point of the stroke.

An improved oil well packing, having tapering split clamps and sleeves or thimbles fitting over them, for the purpose of holding an elastic packing, has been patented by Messrs Isaac La Foy and Jesse Siglin, of Bradford, Pa.

**Hollway's Process.—The Use of Sulphides as Fuel in Metallurgy.**

Mr. John Hollway has prepared the following summarized account of his process for the benefit of those who might not have had time or inclination to read the longer and more technical account given in Mr. Hollway's paper read before the Society of Arts, February 12, 1879.

This process has for its object the utilization of the heat generated by the rapid oxidation of certain mineral substances, which have not hitherto been used as sources of heat for smelting operations. The heat thus obtained is employed in the reduction of the furnace charge, which may be composed partly of sulphides and partly of silicious ores. A current of air is forced through molten sulphides, by which means they are very rapidly oxidized. Great heat is thus developed, rendering the process of smelting a self-supporting operation; therefore no extraneous fuel is required, excepting that employed in raising steam for the blowing engines; where, however, water power is available steam can be dispensed with, in which case all the carbonaceous fuel necessary for the operation is a little coke to start the furnaces, which stands in the same relative position to the ores as wood does to coal in the lighting of an ordinary fire.

It is well known that pyritous minerals are readily combustible, but the best means of utilizing the heat producing property of metallic sulphides is not so apparent as would at first sight appear. Of these sulphides only iron pyrites is sufficiently combustible at a low temperature to burn in the open air, the mass being raised to the temperature at which the oxidation takes place solely by the union of sulphur and iron with atmospheric oxygen. In Spain there are numerous deposits of poor cuprous pyrites, and the Rio Tinto and Tharsis Companies annually treat, at their mines, about one million tons for the extraction of copper only, which does not average 2 per cent. The process employed consists essentially in roasting the pyrites in heaps in the open air, dissolving out the copper from the roasted material, and precipitating it from the solution by means of iron. These operations extend over several months, any gold or silver contained in the ore is lost, and the iron and sulphur are also wasted. The sulphur passes into the air as an obnoxious and annoying gas, desolating the country for miles around the works.

From the earliest ages carbon has been considered a necessity in all metallurgical operations. The first reduction of metal by means of carbon forms a connecting link between the age of stone and the commencement of civilized art. It is well known that carbon burns at widely varying temperatures, as, for example, in our bodies, in a common coal fire, or in a furnace. A great deal of thought has been devoted to the subject of economizing carbonaceous fuel, and great advances have been made in this direction, yet the expenditure of coal or coke necessary, say, to melt a given quantity of metal still far exceeds the theoretical limit. The main causes of this discrepancy may be accounted for as follows:

1. Only part of the oxygen of the air passing into a furnace, acts on the material to be burnt.

2. The oxygen is not brought in contact with the combustible matter with sufficient rapidity to obtain the necessary temperature for the operation.

3. Gases pass off hot and unburnt. These are now, however, frequently utilized.

There is one metallurgical operation in which the first two sources of loss are avoided, viz., "Bessemer's," where, by blowing air through molten crude iron a very high temperature is attained by the combustion of small quantities of carbon and silicon contained in the crude iron; this is, however, not the case in the process of puddling, where the oxidation is spread over a considerable period of time, although the same constituents are frequently burnt in similar proportions. But even in the Bessemer process the carbon is only half burned, and a large amount of heat escapes with the carbonic oxide and nitrogen.

When, however, thin streams of air are forced through molten sulphide of iron lying on a tuyere hearth, a high temperature is produced by the perfect combustion which ensues in the midst of the sulphides, and no unburnt gases, except ing nitrogen and sulphur vapor, escape from the surface of the molten mass. The hot nitrogen and sulphurous acid may be caused to act upon iron pyrites and other mineral matter, and when pyrites are thus heated an atom of sulphur held in feeble combination is in great part expelled, and thus is obtained molten protosulphide of iron, which is subsequently burnt by the oxygen of the air driven in at the lower part of the furnace, thereby producing the heat necessary for continuing the operation. The process may be defined as a system of fractional oxidation, in which the numerous constituents of a complex furnace charge can be separated from each other and concentrated in different parts of the apparatus, the heat necessary for the operation being obtained by the combustion of a portion of the less valuable constituents.

The principal ores of all our ordinary heavy metals, except manganese and tin, are sulphides. Iron, although largely occurring in an oxidized form, is abundantly found in combination with sulphur; and bi-sulphide of iron, or iron pyrites, is an example of sulphurous and combustible minerals. Associated with the iron and sulphur in iron pyrites are invariably found small quantities of other metals, notably cobalt, nickel, copper, silver, gold, lead, zinc, and arsenic. Of these, zinc is almost as combustible as iron itself, while lead and arsenic readily volatilize as sulphides, and cobalt, nickel, and copper are distinctly less readily oxidizable than iron, while silver and gold do not oxidize under these conditions; hence, in supplying air to such material, the iron is the first of the elements to suffer oxidation, so that if the oxidation be arrested before the whole of the iron has been burnt, the cobalt, nickel, copper, silver, and gold present will be found in the unburnt portion. This principle finds a parallel in the Bessemer process of treating pig iron for the manufacture of steel, where a current of air is caused to bubble up through a bath of molten crude iron; the silicon is first oxidized, and is closely followed and to a great extent accompanied by the carbon, and no large amount of iron suffers oxidation, until the whole of the silicon and carbon have been burnt out of the molten material.

The experiments made at Messrs. Cammell's works, at Penistone, in a Bessemer converter, have proved that by blowing air through molten sulphide of iron, the iron and a portion of the sulphur are oxidized, and if the oxidation is arrested before the combustion of the iron is complete, a heavy matte or regulus is obtained, which contains but a small proportion of the iron of the ore, but practically the whole or the greater part of the copper and other less oxidizable metals. In one of these experiments the molten sulphides were run into the converter from a cupola, in which they had been previously melted, and the temperature was kept up until the operation was discontinued, viz., for a period of ten hours, without the use of any carbonaceous fuel, the heat being entirely derived from the oxidation of the iron and a portion of the sulphur of the lumps of pyrites, which were continuously thrown into the mouth of the converter. A Bessemer converter being unsuited for the collection of the gaseous products, the latter experiments have been made in a series of cupola furnaces belonging to Messrs. John Brown & Company, Limited. These experiments have proved the possibility of obtaining a valuable regulus, a slag nearly free from copper, and a considerable quantity of crude sulphur. M. Pourcel, the well known chemist of the Terrenoire Company, has also made some very interesting experiments, having treated by this method a cupriferous sulphide of antimony containing lead and zinc, using heavy spar and silica as fluxes; he obtained a regulus containing the whole of the copper in the form of sulphide, a slag of light specific gravity, and the lead, zinc, and antimony as two separate sublimates, which were condensed in different parts of the apparatus, owing to the superior volatility of sulphide of lead over the oxides of antimony and zinc. In the experiments at Penistone and at Sheffield a cold blast of air was employed, and the gases which passed from the converter or furnace into the open air, carried away with them a large amount of heat. In practice, however, it would be economical to employ a hot blast, which could be heated by the waste heat from the escaping gases. It is remarkable that the least valuable metals, viz., iron and zinc, generate by their combustion the largest quantities of heat.

The process may be employed for the reduction of even the more volatile metals, for example, Mr A. H. Allen, of Sheffield, has thus obtained metallic antimony simply by the oxidation of sulphide of antimony. It is well known that sulphide of lead reacts upon oxide of lead with the production of metallic lead and sulphurous acid. If, therefore, a limited amount of air is blown into molten sulphide of lead, the oxide thus formed in the lower part of the furnace will, in passing upward, come in contact with the hot sulphide of lead, and metallic lead will result with the evolution of sulphurous acid. The furnace having a quiescent hearth below the tuyeres, the metallic lead will collect there, and can be from time to time withdrawn. A limited amount of air must be employed, because if it is driven in too quickly the sulphide of lead would rapidly distill off. In thus treating argentiferous lead ores the silver (and gold if present) would be found with the first metallic lead reduced. When thus treating galena the furnace should have a basic lining.

The process is peculiarly suitable:

1. For the treatment of metalliferous substances which cannot be advantageously treated by other processes. For the extraction of sulphur by distillation, and simultaneously for the concentration and separation of cobalt, nickel, copper, silver, and gold from minerals in the form of metallic regulus; while lead, zinc, antimony, arsenic, etc., accrue in the sublimates.

2. For the treatment of complex ores, for example, gray antimonial copper ores, such as those experimented upon by M. Pourcel. Ores similar to those worked at the well known Bottino Mines, Seravezza, in the Italian Apennines, which contain thirteen or fourteen heavy metals, including silver and lead, for which latter alone they have been worked for centuries. The blende of lead mines, in Derbyshire termed "muck," usually thrown away by the miners, because the large quantity of lead with which it is associated renders the zinc obtained from it worthless.

3. For the treatment of auriferous and argentiferous pyrites. It is well known that in practice it is not possible to obtain the whole of the gold from pyrites by amalgamation with quicksilver, because the presence of sulphur and arsenic sickens and flours the mercury, whereas by fusion the whole of the silver and gold present is obtained.

4. For the treatment of pyrites containing even only small percentages of cobalt, nickel, and copper, which are thus concentrated into a rich regulus, whereas this result is now only obtained by very tedious processes of alternate roasting and reduction. Such ores containing 10 per cent and even 12 per cent of copper exist in South America and many other parts of the world, but are not at present capable of economic treatment, owing to the difficulty of obtaining a sufficient supply of cheap fuel. The process can also be advantageously applied to the treatment of richer ores of copper such as are at present smelted at Swansea.

5. For the treatment of poor lead ores. If such ores are added to a furnace charge of cuprous pyrites, the silica they contain will be utilized and combine with the resulting oxide of iron to form a slag, the galena will be volatilized and be recovered as a sublimate, while any silver present will enrich the regulus. At present, by a costly process of crushing and washing these ores, the galena is concentrated, although a large proportion is left with the *débris*, and passes with the water into the streams, rendering the existence of fish in such waters impossible. The water power now used for washing the ore could, in many cases, be employed for producing the blast.

When thus treating cupriferous iron pyrites, four products are obtained:

1. A matte or regulus containing from 30 to 50 per cent of copper, any trace of cobalt, nickel, silver, or gold the ore may contain, the rest of it being iron and sulphur; it has a specific gravity of 4½ to 5.

2. A slag consisting of silicate of iron from the resulting oxide of iron combined with the silicious matters contained in the ore and the fluxes added.

3. Sublimed sulphur, more or less mixed with volatile compounds of lead, zinc, and arsenic.

4. Sulphurous gases, consisting mainly of sulphurous acid and nitrogen.

The regulus closely resembles, and will replace, the coarse metal of the Swansea copper process, which is now only obtained at considerable cost of labor, time, and carbonaceous fuel. When, however, sulphides of iron and copper present in the bath are treated continuously by a blast of air a point is at length arrived at when the whole of the iron is oxidized, and the regulus in the bath consists of sub-sulphide of copper. If, now, a limited supply of air is introduced, the copper is reduced to the metallic state with the evolution of sulphurous acid.

The slag obtained in the Penistone experiments was essentially silicate of iron containing about 50 per cent of iron and 29 per cent of silica. It had density of about 3·8 to 4, and was in composition somewhat allied to the copper-smelter's ore furnace slag and to the tap-cinder of the iron puddler. By the addition of the calcareous materials, the specific gravity of the slag is so reduced as to cause it to separate readily from the regulus which collects below it. In one of the later experiments, when lime was used, the proportion of copper lost in the slag was very small. This is, of course, a most important point, for when dealing with ores containing but little copper, the presence of even a small percentage in the slag means the loss of a considerable proportion of the copper present. These slags can be utilized for the manufacture of steel, being practically silicious iron ores free from phosphorus, and their reduction in a blast furnace can be profitably effected, as the proportion of iron present is high as compared with the weight of the material, indeed, it may be possible to reduce them while in a molten state.

By resubliming the crude sulphur it can be freed from all impurities except arsenic, and at the works of Messrs. John Hutchinson & Co., Widnes, this is eliminated by means of polysulphide of calcium.

As a certain proportion of the sulphur of the minerals suffers combustion, the resulting sulphurous gases contain from 14 to 15 per cent of sulphurous acid, and hence the proportion of sulphurous acid to nitrogen is nearly identical with that of the gases produced by roasting pyrites in the kilns employed by vitriol manufacturers, and can, therefore, be used with equal advantage for the production of vitriol in leaden chambers. This appears to be the simplest solution of the great problem how to smelt copper without causing a nuisance to the surrounding neighborhood, although a similar result might be obtained by collecting and liquefying the sulphurous acid.

The more incombustible materials it is found practicable to employ without too great a loss of temperature, the wider will become the application for the process; for there are many ores, including silicates and carbonates, containing metals in the form of oxides, which might be conveniently smelted by mixing them with a sufficient proportion of pyritous ores to effect their reduction; in fact, one of the chief practical questions connected with this process is how far it may be trusted to effect the smelting of ores or furnace charges containing comparatively moderate proportions of sulphides.

It is evident that it will almost entirely obviate the necessity for using carbonaceous fuel, at least as far as the production of a regulus is concerned, and consequently the localities in which smelting operations may be advantageously carried on are thus greatly multiplied. One of its chief merits is that it is equally applicable, with comparatively little extra cost in the working, to very poor and very rich ores, for however small the resulting regulus, it will contain nearly the whole of the cobalt, nickel, copper, silver, and gold present in the furnace charge, while any lead, zinc, antimony, and arsenic will be obtained as sublimates.—*Journal of the Society of Arts.*

### Yellow Fever.

Dr. Stanford E. Chaillé, chairman of the Havana Commission, has investigated the facts relative to the prevalence of the disease upon the island of Cuba, and finds that "more than twenty years ago out of thirty-six towns only two insignificant ones were free from it; every seaport town had it.". He claims that the first authenticated epidemic occurred in 1761 instead of 1762, and that it has continued endemic in Havana ever since the former period.

From Dr. D. M. Burgess the following facts were obtained by Dr. Chaillé relative to the steamer Niagara:

"The steamer Niagara, of the line of Ward & Co., is a first-class iron passenger steamer, and made her first trip June, 1876. Notwithstanding due cleanliness, etc., she went into New York with yellow fever on board on her fourth trip, about September, 1876, and has had cases on board every season since that time. These facts were obtained from the captain, and are attributed by him and Dr. Burgess to faulty structure and continued infection, which both gentlemen deem remediable. The result of this faulty structure is that some two inches of bilge water cannot be pumped out. Dr. Vanderpoel, of New York, has been notified of the chief facts. Two cases developed upon her last trip from New York prior to her entering the harbor of Havana."

### Flour Mixed with Mineral Substances.

The author's method for detecting the tenth of a milligramme of alum, magnesia, chalk, gypsum, arsenious acid, etc., added to 10 grammes of flour, depends on the insolubility of the flour of wheat, rye, barley, etc., in chloroform; on their specific gravity, which is less than that of chloroform, and on the specific gravity of the mineral matters, which exceeds that of chloroform. He takes a perfectly dry glass tube 20 centimeters in height, and 2 to 3 in diameter; 10 grammes of the flour are introduced, the tube is nearly filled with chloroform, corked, and shaken for a minute. It is then let stand in an upright position, and in a cool place for some time. The flour which floats on the surface is removed, the chloroform is decanted off and may serve for new operations, and the deposit is treated with cold distilled water, which dissolves alum. The substances insoluble in water are collected on a filter, dried, weighed, and examined physically and chemically. Mineral salts existing naturally in the flour are not deposited, but remain in the floating layer.—*C. Cailletet.*

### American Institute Exhibition.

It will not be the fault of this paper if the coming Exhibition of this Institute should prove to be a chaotic mass of half arranged merchandise on the opening day, September 17, for we have so often given notice of the fact that an exhibition is to be held, and have as repeatedly given notice of the time; nor will it be the fault of the officers of the Institute, for the building is always ready in time, but will, we presume, be the fault of the exhibitor, who, as a general rule, procrastinates and is often many days behind. We should think that an exhibitor would desire that his exhibit should be arranged upon the opening day, and not a week or ten days later. For information address General Superintendent, Room 22, Cooper Union Building, New York.

### The Effect of Great Pressure upon Powdered Substances.

Mr. Spring, a member of the Belgian Academy of Science, has made several very interesting experiments on the above subject with the following results, as reported in the *Chemiker Zeitung*:

In a hollow steel bar, the sides of which were $\frac{64}{100}$ of an inch thick, he subjected several powdered substances to a pressure of 20,000 atmospheres (133 tons per square inch). Molten and powdered saltpeter was pressed into a solid hard mass like porcelain. Powdered poplar wood was pressed into a block of much greater hardness than that possessed by the wood itself. The specific weight of the powder was 0·389, and that of the compressed block, 1·328. A powdered grindstone was transformed into a new stone of the same hardness as the original one. The same was the case with chalk.

### Uralium, a New Metal.

As far back as 1869 the author discovered this metal in commercial platinum obtained from Russian ores. Next to silver it is the whitest metal known; its malleability is as great as that of the purest platinum, but its ductility is much greater, and it is almost as soft as lead. Its melting point lies near to that of platinum, and it is not volatile. Its specific gravity =20·25, and its molecular volume, like those of osmium, platinum, and palladium, is 6·25. Its atomic weight has been found 187·25. In its chemical properties it is difficult to distinguish from platinum.—*A. Guyard.*

### The International Dairy Fair.

At a meeting of the Board of Managers of the International Dairy Fair, August 12, it was resolved to hold the fair during the second and third weeks of December next, at the American Institute Rink. The president, Mr. Thurber, was about to sail for Europe, and was empowered by the association to invite all the agricultural societies of England and the Continent to send butter and cheese to the fair for exhibition and competition with American products. Letters from cattle raisers in various parts of the country encourage the managers of the fair to believe that they will have a much larger number of blooded bulls and cows on exhibition this year than they did last.