water cannot be superheated when they are in a boiler, unless a corresponding gradual increase of pressure also takes place.

At the time of the publication of the articles alluded to, we pointed out the fact that the use of coke or charcoal in boilers would prevent the "kicking" of water and the sudden strains arising therefrom. So simple and easy a method would seem to be worthy of a general trial, which, so far as we are aware, it has not received.

ON CERTAIN HABITS CONSIDERED AS NECESSITIES OF MODERN CIVILIZATION.

The *Nation* in a recent issue discusses the subject of the use of stimulants of various kinds, treating these stimulants as necessities of modern civilization. The almost universal use of some kind of stimulant is the ground upon which it assumes the necessity of their use.

The Brooklyn *Union* also in a recent issue gives its readers an account of the extent to which opium is consumed in the City of Churches, which may be considered as somewhat astonishing. From seventy five to over one hundred dollars per annum is the cost of the opium consumption of single individuals devoted to this habit, from which the quantity they take may be estimated. It is difficult to estimate the aggregate quantity used for purposes of stimulus alone in this country or any section of it. The habit is easier to conceal than the drinking of alcoholic liquors, and statistics are hard to obtain. A country physician once remarked to us that if he could have the exclusive sale of the opium consumed in the single township where he resided, he could make his fortune without charging exaggerated prices.

So much for opium eating. If we now consider how much alcohol, tobacco, coffee, and tea are consumed, we shall have before us the chief articles in demand for artificial stimulation. There will upon reflection appear no need for evidence of the truth of the *Nation's* statement that stimulants are universally used. Is the inference of that able journal that they are necessities of civilization, and its suggestion that they be accepted as such, and the proper kinds of stimulants for different temperaments be studied, so that each individual may select intelligently and wisely, sound and safe advice to the public? We say, no.

As well might we call the wearing of narrow toed boots or chignons or corsets or any other fashionable folly a necessity, on the ground that such follies are universal. The universal craving for stimulants is purely a matter of habit—not of inherited habit, as a rule, although there may be instances of inherited appetite. We believe the world would be better off by far if opium, tobacco, alcohol, tea, and coffee were clean swept from the face of the earth.

But then what would ladies do when they wish to remain out of bed all night to parties and balls? And how would night editors be able to pen their pungent spicy items for morning readers? And how would doctors be able to sustain prolonged deprivations of sleep incident to their vocations? And how would Jones, after having robbed himself of sleep by late hours at his club, be able to eat his breakfast next morning without his accustomed gin cocktail to force his appetite? And Jones, you know, is good for nothing all day unless he takes a good breakfast.

Well, we must say to fashionable party goers, editors, doctors, and poor Jones, that if modern civilization entails necessities which make the wholesale use of stimulants a necessity, society had better make a new departure, and return to a more simple mode of living. Stimulants are like whips applied to overworked horses; they will get a little more work out of the poor brutes for the time being, but all work so obtained is dearly paid for in the end by shortened life and the misery of premature old age burdened by disease, and physical as well as mental pain, or perhaps in something worse.

If medicines of this kind are the necessities of modern civilization, it is as well perhaps to pause and at least make the inquiry whether an exchange of some of our present "*refinements*" (?) of living may not profitably be exchanged for health.

PHARMACY IN PRUSSIA.

Dr. Frederick Hoffmann has published, in the *American Journal of Pharmacy*, a valuable paper on the management of pharmaceutical affairs in Prussia, which ought to attract attention at the present time, when attempts are being made to regulate this branch of service in such a way as to secure the public against frauds and impositions. The education of an apothecary in Germany is conducted according to strict regulations.

The applicant receives the requisite permission from the district physician and district apothecary, after presenting satisfactory testimonials of considerable proficiency in his studies and of good moral character; a thorough preliminary education is absolutely necessary for entrance upon this career.

The apprenticeship is fixed for three years, during which time the master is bound to instruct his apprentices, theoretically as well as practically, in pharmacy and its collateral sciences, and to furnish the requisite apparatus for this purpose. Sufficient time must be allowed to the young men, aside from their daily work in the office and laboratory, to prosecute their studies, and in summer to undertake botanical excursions for the purpose of collecting an herbarium. They have to keep a journal of all preparations made by them, and to enter therein a short description of the theory and practice of the operations. After the termination of three years, the candidate is rigidly examined by a competent commission, and then may be safely entrusted with the functions of an assistant. As such he shares the responsibility of his employer for the proper conduct of the office, except where he merely carries out the orders of his superior. After an additional term of service of three years as an assistant, the student may enter the University course of studies, lasting at least one year, and he can then come up for his final State examination, which is the severest ordeal of all. This examination consists in a series of practical written and verbal questions, covering the whole field of pharmaceutical acquirements, and extending over several months. It includes the preparation of medicines, the execution of qualitative and quantitative analysis, and the examination of poisons, and the verbal examination covers the science of botany, pharmacognosy, general, analytical, and pharmaceutical chemistry, toxicology, and pharmaceutical laws. The final test, which is verbal and public, and to which not more than four candidates are admitted at one time, is passed before the entire board. The candidate who survives this ordeal receives a certificate of qualification from the Ministry of Medical affairs, and the apothecary's oath is administered to him on the occasion of his entrance upon the practical details of his office. The pharmaceutist engages to exercise the duties of his calling in accordance with the laws and regulations, with fidelity and conscientiousness and to the best of his ability.

Grants and concessions to apothecaries are made dependent upon actual necessity; in the cities the number is one to seven for 10,000 inhabitants, and in the country one to twelve for 15,000 inhabitants. In the course of time the grants become very valuable, so that the leading apothecaries are wealthy men. The German apothecaries confine themselves to a purely medicinal business, that is, to the compounding of prescriptions and the sale of medicines. The sale of toilet and fancy articles has been introduced in a few large towns, but although tolerated is looked upon with disfavor by the government, and as entirely *infra dig.* by the regular members of the profession.

It will be seen from the above that pharmaceutical matters are conducted upon very different principles in Germany from what they are in this country; and although it may not be feasible to copy all of the foreign regulations, there are certainly some of them which could be imitated by us with advantage.

Our legislature should provide for the education of pharmaceutists, and then insist upon a diploma as a condition to obtaining a licence to dispense drugs. A political commission appointed to examine apothecaries after they are well established in business is the wrong end at which to commence the reform. It is better to shut the lion out altogether than to attempt to turn him out after he has got in. We commend Dr. Hoffmann's pamphlet to the attention of our legislators.

THE INTRODUCTION OF INDIA RUBBER SHOES.

Perhaps never was the fact that large industries often grow out of small beginnings better illustrated than in the introduction of india rubber shoes.

In a recent conversation with a well known wealthy and distinguished citizen of New York, he casually remarked that he was the first man that ever wore a pair of india rubber shoes in this country. Our curiosity being excited by this statement, he gratified us by a narration so interesting and instructive that we herewith give it in substance to our readers.

Previous to 1821, india rubber had been imported only as curiosities, in the form of crocodiles and turtles, and other reptiles, and also small bottles used for erasing pencil marks. In that year an intelligent sea captain brought home from a voyage a pair of what appeared to be models of shoes made of solid pure india rubber. They were only five or six inches in length, were closed at the top, and of the natural creamy color of the inspissated juice of the caoutchouc tree.

The shoes were given to the gentleman above referred to, then a lad, possessing the inquisitiveness natural to the intelligent youthful specimens of the genus *homo*.

As usual, this lad had a jackknife among the treasures of tops, kitestrings, and other incongruities with which boys' pockets are generally stuffed, and possessed that universally strong boyish impulse, to use his knife upon any new material presented to his notice. This, coupled with a desire to see the inside of these queer little shoes, prompted him to cut them open upon the instep.

The openings disclosed two clay lasts, which were easily broken up and removed by the knife.

The thickness of the rubber was found to be at least three quarters of an inch.

How to get these miniature shoes upon his feet was the problem this lad now undertook to solve. They would not stretch enough to "go on," notwithstanding the well known ingenuity with which boys of his age contrive to get through small holes in fences, to clamber up precipices impossible to adults, and to accomplish feats astonishing to all who forget they ever were boys themselves.

Whether it was suggested from something he had read, or whether in random experiment, our never-to-be-conquered youth conceived the idea of softening the rubber by boiling water and stretching the refractory shoes upon lasts as large as his feet. This done, the shoes were perfected except in color.

The natural resort of schoolboys, in such an emergency, ink, was tried, but, to his chagrin, it washed off as soon as the shoes were wet. It is probable the boy had read something of blackening rubber by smoke; but if he had not, it is certainly singular that he should have hit upon the very method which has been used so long for this purpose. He saturated the shoes with carbon deposit by hanging them in a chimney. Then triumphantly donning his new acquisition, he marched out into the streets, through puddle and pool, the envy and admired of all the boys who saw him.

And it came to pass that, this thing being brought to the notice of the sea captain who presented the shoes to the lad, he had the sagacity to import more of the shoes on his next voyage, which, finding ready sale, the regular trade in rubber shoes commenced, and in 1823 it was an established business.

This trade gradually brought into public notice the vast supplies of caoutchouc existing in various parts of the world, and led to the experiments of Goodyear and others, which have developed the manufacture of an endless variety of rubber articles into one of the most important industries of the age.

THE LABOR PROBLEM—CLASS ORATION FOR 1871 AT YALE.

The Class Oration delivered on Presentation Day at Yale, July 11, 1871, is a production of far more than the usual merit. The graduate who delivered it, Orville Justus Bliss, of Chicago, Ill., is evidently a man of brilliant promise. It is rare that in such a production so much thought is displayed.

The subject of the oration was "The Educated Man in American Society." After making a general inquiry into what constitutes society, and glancing at its imperfections, the assertion is broadly made, that, "disguise it as we may, society at large has not yet been taught a genuine respect for labor." The subject of the relations of labor to capital is then taken up. "Labor parties," it is forcibly said, "may not prove that eight hours a day ought to be a legal day's work, but they do prove that something is rotten in American society." And here the orator makes the strong point of his address, viz., that political economy having failed to relieve the burdens of the laboring classes, society has adopted the charity system. He says:

At the risk of a glittering generality, I pronounce this the age of poor-houses. Hospitals for the sailor, asylums for the inebriate, and retreats for the spinster, spring up in a night, and open their doors to the unfortunate. Never was society so thoroughly nursed as it is today. Now no one would disparage these enterprises. They honor the head as much as they do the heart of their authors. But they do not meet this great social problem of poverty, and they never will. For they are not philosophical. The best gift you could bestow on a cripple would be to set him on his feet; and if some disease is crippling society, crutches will never make it walk straight. Will it develop into life and vigor the self-reliance of an able bodied man to feed him like a child with his daily bread? The truth is, there must appear in society some miracle worker, personal or impersonal, which shall bid these crippled, halting, and helpless thousands rise up and walk.

If, then, our institutions cannot be trusted, if political economy has proved itself futile, and if charity, however broad in its reach or multiplied in its form, can work no permanent cure, to what shall we turn? Must we abandon the question in despair? Must we accept as a fact the existence in America of an isolated class? While England is manfully fighting her way to justice in the face of tradition and law, shall we ignobly surrender this very fortress of human rights? I do not believe it. That same political economy for which so much is claimed, teaches that man with his muscle alone is able to produce more than he can consume. And if he can do this unaided, where is the boasted beneficence of invention, if it is to carry only physical and moral poverty in its path? Given a community of ten persons, with one hundred bushels of corn, and they ought to enjoy greater material prosperity, than the same number of persons with fifty bushels; and does any one doubt that we can produce the one hundred bushels with our labor saving appliances, where we could produce fifty without them? If, then, it has been demonstrated that destitution is not a necessity among a savage and untutored race, is it inevitable here, where art has doubled and trebled nature? Does not the contemplation of these facts force us back to the truth with which we started, namely, that society fails to *distribute* fairly its labors and its rewards?

Mr. Phillips would reduce the amount of production, and thus bring capital to terms. There could not be a greater fallacy. The bane of society is not that the rich live in palaces, but that the poor live in huts. Rather, if it were possible, increase production ten, twenty, yea a hundred fold, until the rich are fairly surfeited and gorged with luxury, and when they can neither eat, drink, nor waste any more, some will overflow and find its way into the hovels of the poor. But that is a chimera. Once more we are compelled to ask: What shall be done with the labor problem? I began the study of this subject with no preconceived notions, and utterly uncertain as to the conclusion which would be reached. But truth compels me to sum up the answer in a word, old indeed, and monotonous in sound, but gathering a fresh meaning from this new connection. It is the word education. We must educate two classes, the poor and the not poor, which you will admit to be a pretty exhaustive subdivision of American society.

We must educate the laborer, first, for his own work. If knowledge is power, much more so is skill. In this respect a lesson may be learned from France. For example, drawing is taught in our schools merely as an accomplishment, and in most instances a very imaginary accomplishment at that; in France, on the contrary, it is an art, and when the French peasant boy leaves the school for the workshop, he is able to sketch the machine before which he stands. Hence a certain independence; and independence breeds self-respect. The workman should be taught not only how to work, but also how to manage. Of all the blessings which the genius man has bestowed upon labor, I believe that co-operation is greatest and best, for this reason: It makes the employé his own employer, and thus capital and labor cease to quarrel. It is destined to throttle monopoly, and to be the lever upon which the working class will raise itself to power. But hitherto it has been almost useless to them, because they have no competent managers. Our duty is, by industrial schools, by institutes of technology, by free commercial colleges, or by some other means, to put them in possession of those acquirements which will meet this demand. Educate the workman thoroughly in his own sphere alone, and half the charity houses in the land will be compelled to pull down their signs.

But, secondly, we must bestow upon them that broader in-

telligence which will fit them for a position in society. Give a Yankee boy five years in a district school, and he is ready to do anything—trade, shovel, or lecture. His self-confidence may be absurd, but it contains a great secret, nevertheless. The misfortune of the foreigners who fill our workshops and perform our drudgery, is that they are able to do but one kind of work.

The remedy for these evils is then stated to be, education; education—which breeds independence by making men their own employers. This sounds a little indefinite, but we think it will not be found so when considered as it ought to be. It is through education that mankind will at length come to reject the wages system as bad for both employer and employee; through it, that the truth will yet be learned that wounds and scars received in honest work are as honorable as those obtained in battle. It is through this great moral renovator that we shall ultimately be led to know that he who has done all he could for the society in which he lives, is entitled, when superannuated, to be held as something better than a mere pauper, whether his "*all*" has been much or little. It is through education that the masses will be taught to array themselves against large and greedy monopolies, and overthrow them, as all things which oppress the many to pamper a few must ultimately be overthrown. It is through education that the world will advance to the adjustment of its inconsistencies and incongruities. But what kind of education? Not that of books alone, but by the experience, of centuries to come, of suffering, of fierce combat, of famine, of the gradual growth of the consciousness of power in the down-trodden, and of the futility of persistence on the part of those who oppress them. The time is coming, perhaps sooner than any of us think, when they who do the work of the world shall rule in council, and divide unto themselves the fruits of their toil.

It is vain to shut our eyes to the plain fact that the labor question is pre-eminently the question that now most presses for solution. Who will be the prophet that shall lead us out of the wilderness?

[For the Scientific American.]

OCCASIONAL NOTES.

BY G. E. H.

Amsterdam, August 13, 1871.

ENGINEERING SIGHTS IN HOLLAND.

We found Brussels discussing two questions of interest to the readers of the SCIENTIFIC AMERICAN; the one that of connecting herself more directly with the sea by an immense ship canal, which shall make her a maritime port by bringing the largest cargoes directly to her warehouses; and the other, the danger to be anticipated should the New York Museum, that is to be, become a strong competitor for her paintings and her statuary. "America," the daily papers bitterly exclaim, "possesses, nor can produce, nothing of art, and must depend on Brussels for supply, while they will bring us in exchange, only some cotton and miserable petroleum, more dangerous than gunpowder." Sad news this to to our future Bierstadts and Powers. The loss of attraction to the pockets of American tourists, has possibly some bearing on her temper.

Motley's able "Rise of the Dutch Republic" had first turned our thoughts, and now our feet toward

> "The land that rides at anchor, and is moored
> In which they do not live—but go aboard."

So, leaving the accustomed track—of the Rhine in its middle course—we arrived at Antwerp, only to be disappointed in finding little of engineering interest, save in the new system of fortification, which is being completed with all the appliances of present military science and skill, at a cost of over $12,000,000. The Arsenal and Pyrotechnic school are quite busy in manufacturing artillery appliances and ordnance stores, reminding one of Woolwich on a small scale. In the now remaining docks, there is nothing out of the ordinary course, but there can be no doubt that previous to 1814, and for that period, the docks and basins completed by Napoleon were astonishing.

After viewing the architectural and artistic beauties of Antwerp, to reach Rotterdam one takes the rail to Moerdyk, and steamer thence to Rotterdam; but it is expected that in a year, the three grand railway bridges now building will afford uninterrupted railway communication with North Holland. The first of these works is now nearly completed at Moerdyk, and consists of fourteen iron girder spans, each of 328 English feet, with a swing span at the southern extremity, very elegantly arranged. At the point where it crosses, the Hollands Diep is 8,200 feet wide. Each span, complete in itself, is constructed on an island at the northern extremity, floated into place upon two immense pontoons at high water, and allowed to rest upon its respective piers by the subsidence of the tide. Ten of the girders are at present in position, and two complete on the shore. The majority of the piers rest on cylinders sunk, by atmospheric pressure, 70 feet below low water; the others are founded on piling and concrete. The absence of the resident engineer prevented us from obtaining such details as would have been interesting, and upon our arrival at the Hague, we found that the Government reports upon this and the Rotterdam bridges out of print.

The second bridge we passed at Dordt. This is also of iron, but of small elevation above water level, and consists of two spans of 287 feet, two of 211 feet, and two swing bridges, each 88 feet in length. At Rotterdam none of the superstructure has been placed in position, though all the piers, except that which is second from the northern shore of the Nieuwe Maas, are complete. They have all been constructed similarly to the piers of the bridge at St. Louis, Mo., the iron caissons being supplied with compressed air by eight pumps, driven by two large portable engines. The compact and convenient arrangement of the air and discharging locks is noticeable. The caisson to low water mark is laid in Dutch bricks, and finished in Norway granite. This will have five spans in all, two of 295 feet, one of 88 feet, and a swinging bridge, 176 feet in length, for masted vessels. A viaduct, nearly a mile in length, will carry the railway into the heart of Rotterdam. These later examples of engineering science contrast oddly enough with the old canals intersecting the Dutch cities, their innumerable draw bridges, and the quaint customs of the inhabitants, to which the hundreds of windmills form a suitable background. Rotterdam and Amsterdam being both built entirely on piles driven 70 feet into the morass underlying, may be said to be the most wonderful cities in existence; and, in fact, when we consider that nearly three quarters of entire Holland has been reclaimed, little by little, from the Rhine or the sea, and is only now held from the irruption by the constant attention of the "water staat," or Government hydraulic engineers, we can hardly wonder that the Dutch have obtained a character for perseverance far above all other nations.

From the Hague to Leyden, and thence by private conveyance to Katwyk, 5½ miles to the North Sea, to visit the gigantic "sluice gates" built by Conard, in 1809, for Louis Bonaparte, then King of Holland. This artificial exit of the Rhine to the ocean consists of a triple set of sluices of two, four, and seven pair of gates respectively. The immense dykes at the seashore are founded upon piles driven in loose sand, and faced with heavy limestone masonry. When, at ebb tide, the gates are opened, the accumulated Rhine water passes at the rate of 100,000 cubic feet per second. It was our good fortune to be present at the ebb, and (by the judicious expenditure of a guilder) shown all the details.

The extension of the railway from Haarlem to Amsterdam was only accomplished by building the earthwork upon alternate beds of fascines and rubble, held together by stakes and wattles, as the marshy soil of Holland has obliged the majority of her public works to be constructed; but, to offset this expense, cuttings and grades are seldom required.

A visit to the Leeghwater engine near Warmoud, which was one of the first pumping engines erected to drain the Haarlemmer Meer, should not be omitted. We found the engine undergoing some repairs, but the old Cornwall affair readily lifts eleven five feet pumps at each stroke, discharging over 60 tuns of water. This engine, together with one at Half-weg, and another near the Spaame, converted the Haarlem Lake into 45,230 acres of arable land in four years, the average depth being 13 feet below the canal level. This immense Polder now maintains between seven and eight thousand persons, two thousand horses, six thousand cattle, and nine thousand sheep and pigs, at a cost of only 60 cents per acre per annum for pumping engines and repairing dykes. The dykes have a foundation of 120 to 150 feet in width, and are generally a combination of earth, sand, and clay, frequently thatched with a wicker of twigs staked to the surface. The base is often faced with masonry or piling. When we reflect that by a judicious system of dyking and drainage, not only are useless swamps transformed into valuable lands, but that the health of the near inhabitants, endangered by proximity to pestilential morasses, which poison their surroundings, is protected, it is certain that the hydraulic works of Holland deserve special study by our rising engineers. In our next, we will speak of the great ship canals of Holland.

SCIENTIFIC INTELLIGENCE.

MR. RUTHERFURD'S RULED PLATE.

Mr. Lewis M. Rutherfurd, of New York, has succeeded in accomplishing a feat that has hitherto been the monopoly of M. Nobert, of Germany, namely, the successful ruling of a glass plate, that is technically called "a grating." The chief difficulty in preparing these gratings consists in ruling the lines with adequate accuracy, it having been found that an error of $\frac{1}{250000}$ is sufficient to render them inapplicable for purposes of scientific research. The lines on the plate should be about $\frac{1}{1500}$ of an inch apart, and extend over a surface about two inches square.

The lines are ruled with a diamond, absolutely parallel to each other, and, by means of such a plate, a diffraction spectrum is produced without the use of prisms, and the spectrum is a very pure one. Parallel rays are allowed to fall on this grating, and a number of spectra are produced on each side of the glass plate, any one of which may be viewed by a telescope of low power placed in the right position. By means of Mr. Rutherfurd's grating, eight spectra can be seen, and the effect is equal to that produced by a battery of prisms. The spectrum is exceedingly faint, but in scientific research it presents the great advantage that any spectrum obtained in this way will bear direct comparison with one obtained with another plate.

Glass and bisulphide of carbon prisms modify the action of light, as the material of which the prism is composed acts specially on different rays of light. The spectrum produced by the glass grating is very unlike the one with which the public are familiar, for in it the yellow rays are in the middle the spectrum instead of near one end.

It is to be hoped that Mr. Rutherfurd will permit his ruling apparatus to be used in the preparation of gratings, for scientific research and for adaptation to instruments to be used in technology. A spectroscope made of these glass plates may open up a field of research not attainable by the ordinary prisms.

WASHING PHOTOGRAPHIC PRINTS.

Anthony's *Photographic Bulletin* gives an account of a new process, for washing out all of the hyposulphite of soda from prints, that is worthy of notice. Mr. H. J. Newton, of New York, accomplishes this object by decomposing the last traces of hyposulphite by means of the acetate of lead. A solution of the pure crystalline acetate of lead is made of the strength of one grain to the ounce of water. This is the strength for use; it may be made stronger for stock. After the prints have been well washed in three or four changes of water, they are to be placed in the lead solution, when the remaining hyposulphite is immediately decomposed, forming sulphate of lead and acetate of soda. After remaining a few minutes, the prints are removed, and finally washed in three changes of water. The sulphate of lead, being insoluble, will not be likely to adhere to the print, but care should be taken to have no excess of the acetate of lead left in the paper, as that would, if anything, be worse than traces of hyposulphite. The fading of photographic prints is chiefly due to the difficulty in washing out the hyposulphite, which, in course of time, destroys the picture. This method of Mr. Newton appears to thoroughly overcome the difficulty.

DECOMPOSING PHOSPHATES WITH SEA WATER.

Native phosphates are insoluble so as to be all but worthless as fertilizers. They require to be ground and treated with sulphuric acid to convert them into superphosphate, in which state the mineral becomes soluble and capable of being assimilated by the plant. Mr. Commins, of South Carolina, proposes to circumvent this tedious and expensive process by calcining the nodular phosphates of that region in a reverberatory furnace, and, while the mass is still hot, allowing sea water to trickle down upon it, by which it is claimed that the stone is not only disintegrated but rendered soluble.

What there is in sea water beyond the small percentage of salt to give it a preference over any other water, does not appear; and there is room for doubt as to the effect of steam and water in rendering a mineral phosphate soluble. If the process can be accomplished in this simple way it will be a great improvement on the use of sulphuric acid, which is attended with so many disadvantages. It may be that the water and heat act to thoroughly disintegrate and comminute the mineral, so as to render its assimilation by the plant possible: and the longer it remains in the soil, the more thoroughly would it be likely to be decomposed. So, too, if bones were ground and treated in a similar way it is possible that they could be applied as a manure at once, dispensing with the use of sulphuric acid.

It is claimed that the constituents of the sea water, notably the lime, potash, magnesia, and soda salts, add materially to the fertilizer treated in the new way; this is no doubt true, only it would be vastly cheaper to procure these salts from the residues of the Stassfurt mines rather than obtain them by the evaporation of large quantities of sea water. The Stassfurt mines can furnish all the crude potash and magnesia salts that may be required, and it is probable, as further developments are made, that the Louisiana salt beds may reveal deposits of a similar character.

The whole subject is of importance, in view of the want of fertilizers for the impoverished lands in many parts of our country.

American Institute Fair.

The annual exhibition of the American Institute was formally inaugurated on Thursday the 7th by the usual ceremonies of music, a prayer, a poem, and an address by E. G. Squier.

This constitutes the nominal opening, but chaos reigns throughout the building at the time of going to press, and it looks as if it would be some time yet before the machinery department is in running order, or articles classified and placed in position to render the exhibition attractive.

When the Fair is in good working order, we shall take occasion to notice such machines and articles as are novel and meritorious.

LOUISIANA STATE FAIR—BOILER AND ENGINE WANTED.—The announcement of the fifth Grand State Fair of the Mechanics' and Agricultural Association of Louisiana, commencing November 18, 1871, appears in our advertising columns, with an advertisement stating the desire of the Association to purchase an engine and boiler to be used at this and succeeding fairs. This advertisement should elicit the attention of manufacturers, who will find it to their interest to have their engines so thoroughly advertised, as would be the case when placed in so conspicuous a position as in this annually crowded exhibition.

THE INDUSTRIAL ASSOCIATION OF GEORGIA announces its first annual exposition to be held at Savannah on November 21 and following days. The list of premiums comprises rewards for excellence in all industrial, agricultural, artistic and domestic pursuits. Mr. H. D. Capers is the secretary of the association.

THE THIRD ANNUAL MISSISSIPPI STATE FAIR will take place at Jackson, during the week commencing on Monday October 23d. The prize list is long, and competition is invited in a judiciously varied list of objects and pursuits. Mr. J. L. Power is the secretary of the fair his address is Jackson, Miss.

DR. THOS. SCHNEBLY, surgeon-dentist, a man of literary and scientific attainments, an editor, and the inventor of several useful improvements, died recently at Hackensack, N. J., aged sixty-nine. He was the patentee of several excellent inventions relating to harvesters, grain weighing machines, horse rakes, etc.

J. H. HALLENBECK suggests for photographers the use of thin sheet rubber instead of yellow glass for the sensitizing rooms. Light admitted through this rubber will not act on the sensitive plates.