are unable to make much headway against the large petroleum exports from the United States. An immense quantity of such gas is wasted in the production of paraffin. Every tun of carbonaceous shale destructively distilled yields from 2,500 to 3,000 feet of the gas, in addition to other products, and our contemporary places the amount of shale thus treated in England and Scotland at 600,000 tuns.

In some large works, this gas is directly collected and used for illuminating purposes in the vicinity; and at one time it was proposed to illuminate the city of Edinburgh by conveying the vapor from the Addiewell Works near by. The new invention, it is now said, provides a way of bottling this gas —that is, converting it into a highly volatile liquid, a gasoline, which may be found a staple and valuable article of commerce. The inventor is Mr. J. J. Coleman, F. C. S., and his machine is based on the well known principle used in such ice-making apparatus as that of Windhausen and Mignot, namely, that air, when compressed and then allowed to expand, produces cold, especially when, in the act of expanding, it is made to perform work, such as driving a piston in a cylinder. The shale gas, it appears, is first compressed; then, after removing from the machine the collected liquid, the inventor causes the compressed gas to work an engine which delivers the exhaust gas at a temperature below the freezing point. The most ingenious feature of the invention is that the power which is first employed in compressing the gas is in great part recovered by the expansion of the gas in the act of producing cold: and owing to this result, when the machine is in full action, the steam may be, in a great measure, turned off. The gas thus works as it were in a circle; but of course it is constantly diminishing in quantity, and at the same time the loss is being made up from the condensers, which, in their turn, are attached to the retorts.

Very brilliant illumination has lately been obtained in Paris by saturating coal gas with gasoline and then burning it with oxygen. With Mr. Coleman's liquid, it is believed, a similar saturation can easily be effected; and Messrs. Laidlaw & Sons, of Glasgow, well known gas engineers, have undertaken the manufacture of the necessary machinery for treating a quarter of a million cubic feet of gas per day as an extended experiment. It is believed that about 2,000 gallons of the gasoline may be weekly obtained from this plant. Some of the material yielded will probably be naphtha; but the average specific gravity, it is stated, will range about 0·684. It is expected that there will be a large demand for the product at one shilling sterling (24 cents) per gallon.

KENTUCKY WEATHER PROPHETS.

The weather prophet of Kentucky farmers, according to the Louisville *Commercial*, is the breast bone of a goose, a yearling goose; and on the strength of the prognostications of such a bone, that paper predicts that the coldest weather of the present season will come after the middle of February.

The *rationale* of the augury is extremely simple. The breast bone of a young goose is translucent, with cloud-like spots in places, which white spots denote cold weather. It is to be inferred that all the geese of any year have precisely the same cloudings on their breast bones, though this important circumstance is not specially noted. Nor is any information given with regard to the geographical area covered by the goose-bone prediction in any case. We beg the *Commercial* to investigate this matter more thoroughly, for the benefit of the Congressional economists who want to abolish the Signal Service Bureau and all the sinecures incident thereto. Probably the family in Woodford county—who have so carefully preserved the little prophets for fifty years, and declare that not one of them has been wrong in its predictions—would be able to clear up all doubts and difficulties on this score, and demonstrate the utter wastefulness of telegraphic "probabilities" when prophetic certainties are so easily procurable.

In this connection we may properly mention the proposition of another Kentucky gentleman, who has been telling the Cincinnati Christian Association how to impose a wintry climate on the poor naked denizens of the South Sea Islands, and transfer their balmy climate to our own shores. For a man rejoicing in the title Reverend, and a company styling themselves Christian, this project, we may be permitted to say, is about the coolest we have ever heard of. But it is the scientific, not the moral, aspect of the proposition that we have to do with here.

At first thought, no undertaking would seem to be of more difficult accomplishment than the shifting of the climate of any hemisphere, massing all the cold in one part and all the warmth in another; but our reverend lecturer shows how it can be done with the utmost certainty and ease. Everybody knows that the south wind brings the warmth of sunnier climes, while the north wind brings arctic cold, provided, of course, that they blow long enough and far enough upon the earth's surface. And nothing is simpler than to suppose that if a south wind could be kept constantly blowing over our country, we should enjoy a summer temperature all winter. To most meteorologists the *if* in the case is a portentously large one, but not to the Rev. L. B. Woolfolk, of Lexington, Kentucky. He knows that the south wind is always on the surface of the earth, except during storms, and even then the north wind never has but one track at once. Consequently if we make a track for the north wind and keep it there, we shall have, everywhere else, a prevailing south wind and a genial climate. It is just as clear as that two and two make twenty-two. Now storms are always the result of a conflict between north wind and south wind. It is well known that heavy cannonading always raises a storm by breaking a path for the north wind. Therefore keep up a deuce of a racket where you want the north wind to blow, and you'll certainly have the balmiest of south winds for ever blowing right and left.

The learned lecturer proposes—and very wisely, seeing that the South Sea islanders are not able to resent the imposition—proposes, we repeat, to make the Pacific Ocean the track of the boreal winds, by a perpetual *feu de joie* on the Aleutian Islands. We are told by the Cincinnati *Gazette* that he was eloquent in depicting the results of such an easy and beautiful re-adjustment of the winds. The deserts of Asia and America would be visited with seasonable rains; warm weather would blow up the Atlantic (not like dynamite, we trust) into the Arctic Ocean, bearing before it tropical waters, until the arctic coasts, swept with tropical winds, would become habitable; and the arctic seas, flooded with tropical air and tropical water, would become the highway of commerce, and vessels would sail through open water at the pole, and every goose bone would become immaculately translucent, except in the South Sea islands; and as the people there do not keep geese, the change would signify nothing to them.

A word of admonition here. This is the Centennial year. We know how it began, and can faintly estimate what terrific reverberations will arise from time to time toward the culminating day of the year. Now that Mr. Woolfolk has spoken, we know what a terrible succession of arctic waves we are liable to bring down upon ourselves, blasting our crops and making the derided Ulster a Centennial necessity, while the shiftless Sandwich Islanders and the rest will bask in endless south winds, needing not so much as a pocket handkerchief for protection from the weather. With the earnestness of conviction, we say: Don't! For heaven's sake, keep still. If the yelling must be done and the powder burnt, let them be transported to the Aleutian Islands and discharged there. It will be hard for the Aleuts; but they are few and feeble, and know nothing of Centennial joys and fears. And as for the people south of them, let them —no: that involves a question of morals which is without our sphere.

OPIUM DANGERS.

It is a curiously suggestive fact that very few of the weekly journals, especially of literary nature, which go directly into families, can nowadays be examined but that somewhere in their advertising columns are found announcements offering radical cures for the opium habit. We have found these advertisements abundant in fashion magazines; and indeed so widely spread are they, and so persistently are they kept before the public, that a stranger might seriously ask himself whether the mania for the drug be not as strong in this civilized country as in China. Two or three cases, of those who have become addicted to the use of opium through its employment as a medicine during acute illness, have lately been brought to our knowledge; and some further inquiry leads us to believe that the large majority of opium eaters thus acquire their baneful taste. Dr. J. B. Mattison, in an article in the *Medical Record*, strongly advocates this view, and re-inforces his conclusions with a timely caution to physicians regarding the careless prescribing of the drug. It appears that, while alcoholic intoxication is decreasing throughout the United States, opium drunkenness is increasing, and the dealers in crude opium and the manufacturers of its alkaloids assert that the importation of the one and the productions of the other are rising rapidly year by year: so much so regarding morphia, that at one of our largest manufacturing centers the supply is said to be insufficient for the demand.

Dr. Mattison adduces a most interesting array of instances in proof of his views. Cases are mentioned of persons (who previously took opium to gain relief from the pain of sciatica, or neuralgia, or similar acute maladies) becoming confirmed inebriates, utterly unable to disenthral themselves, and swallowing their daily potion not as a means of gratification but as a physical necessity. Legislative enactments prohibiting the refilling of an opiate prescription, or the dispensing of opium in any form, unless in pursuance of a prescription from the attending physician, would, Dr. Mattison considers accomplish an immense amount of good. It would not wholly check the vice, but would greatly mitigate the same "In carrying out the reform," he adds, "it should be the aim of every practitioner, when called upon to prescribe this most valuable medicine, to see to it that he exercises a discriminating care in so doing, by careful inquiry as to the neurotic status of his patient from the standpoint of hereditary tendency, and, if necessity demands a somewhat prolonged administration, to watch most warily and guard most strenuously against the earliest indications of an appetite that, thoroughly established, will scarcely be denied, and which entails upon its unhappy possessor a darkness so dense, a horror so indescribable, that death, at times, seems preferable."

THE ARISTOCRACY OF ALL.

"Yes"—we hear it said, even in this Centennial year of the Republic—"the theory of democracy is well enough; but after all the real progress is the result of class distinctions and privileges. Culture implies spare time and abundant means: in other words, an aristocracy of some sort, which must be supported by the labors of others. Only by the exemption of some from the drudgery of self-support is it possible for civilization to exist, much less to advance."

The assumption—it cannot be called an argument—is plausible, but it will not bear examination. However much the civilization of the past may have rested upon systems of privileged classes, the civilization of today rests upon and is carried forward by the working masses: not slavish toilers, kept down by class restrictions as of old, but freemen, who use their brains as well as their hands, and know that all things are possible to intelligence and thrift. It is by those who personally earn the right to leisure time, very frequently in the process of earning it, that the great steps of human progress are taken. As Higginson cleverly remarks, history is not written by the privileges of the rich, nor, we would add, by the privileges of the high born, but by the progress of the many. "Privilege traveled in its carriage with all clumsiness twenty miles a day; but when the people wished to go, steeds swifter than the wind were harnessed, and long lines of steel stretched far away that they may go in speed and safety. Privilege could only send its messages by fires on hilltops, and thus communicate slowly joy or grief; but for the messages of the people, the flames were condensed in one spark, and sent across continents and under oceans. Everywhere we find the failure of privilege the success of the whole. An aristocracy of all I want, where the humblest child may come from his cradle into a grand and glorious career."

This is the ideal that was aimed at by those whose actions we commemorate in this Centennial year. Its practical achievement may be celebrated a hundred years from now. The aristocracy of birth—hereditary rank, we mean, not inherited virtue, intelligence, and personal power—is done with. Its place has been usurped by what Higginson styles the aristocracy of the dollar. In the struggle for position, wealth leads, for it has the advantage of power.

To acquire wealth requires in the main the possession of force, albeit rude and pushing. To keep wealth requires, even more imperatively, personal ability. "So the aristocracy of the dollar is as foam on the waves of progress, bright, evanescent, changeable as the wave itself. It represents actual power, not past possessions like hereditary aristocracy."

But ability to hold is not a common inheritance. Nature is averse to hereditary rank, and titled families soon run out unless sustained by plebeian blood; and still more heavily weighted in the race for life is hereditary wealth. The aristocracy of birth is of the past. The aristocracy of wealth rules to-day. But it too is doomed. There is but one stable aristocracy possible, and that is the aristocracy of all, based on common freedom, common virtue, universal intelligence, and universal labor. The doers shall inherit the earth.

IMPROVEMENTS IN THE ORGAN.

In another portion of this issue will be found an illustrated description of some new and remarkably ingenious applications of electricity to organs, by means of which an instrument in one part of a hall is played from a keyboard located in another and distant portion. The invention is one which easily suggests the possibility of the distance between the keyboard and organ being increased, and thus, perhaps, may be a precursor of those possible electric devices to which we have, in the past, alluded, and by which we may be able to lay music in every house in New York city with as little difficulty as now is found in putting in the gas.

While this idea may be called an advantage of electric music yet to be realized, the immediate value of the use of electricity in the instrument rests on a different basis. That value is the vastly increased facility in handling the keys offered to the player. There is a large church organ now in this city in which a force of 5 lbs. is required to push down each key. It is easy to calculate the amount of power which the organist must actually develop to play at all. For instance, in the well known air o "Old Hundred" there are 34 notes. Supposing each note to represent a chord to be played by each hand, and each chord to average three notes, there are 204 notes to be pushed down a distance of, say, $\frac{1}{4}$ inch each for every verse or repitition of the tune. The time occupied in singing the air is slightly over 1 minute. Therefore 5 x 204 or 1,020 lbs. are moved through a space of $\frac{1}{4}$ inch in the above period by the fingers and elbows alone, equal to about 21$\frac{1}{4}$ lbs. raised 1 foot high in a minute, or $\frac{1}{1500}$ horse power, approximately. The labor an organist has to perform in carrying through a long mass or choral service is considerable. With the electrical organ this labor is entirely obviated; the touch is lighter than that of a pianoforte.

The builder of this new organ has succeeded in reproducing the *timbre* and quality of the human voice by machinery in a manner which is certainly wonderful. The echo organ is located in the garret, at a point where three angles of the roof meet, and the sound issuing from the open top of its case is reflected down upon the ceiling. The effect is such that every sound heard in the auditorium, though faint, is perfectly clear. By drawing the *vox humana* stop—a close copy of the similar arrangement in the celebrated Freiburg organ—and also the *tremolo*, the performer is enabled to produce not merely a sound of the quality of the voice, but also one having the voice's natural defect—the *vibrato* or shakiness of tone. Under the circumstance of the illusion, aided by the fact that the sound comes from an opposite quarter to that in which the performer is located, it is exceedingly difficult to convince one's senses that they are deceived. The effect is substantially that of an actual choir. The famous talking machine which was exhibited in this country several years ago, by means of rubber vocal arrangements, articulated words with great clearness, infinitely better, in fact, than the average vocalist in singing. The difficulty was, however, the dismal monotone, and this the genius of the inventor could not overcome. We therefore suggest a combination of the talking machine and organ; both are played from key boards, and therefore the machine could be arranged to connect with the organ manual by a simple stop. Send the tones of the *vox humana* echo through the mechanical larynx, and there is a singing machine. Perhaps the time is not far distant when a congregation will be provided with a mechanical choir.