

It is also satisfactory to learn that although the birth rate has continued at much the same average, the number of children born in wedlock has progressively increased. The mortality from preventable causes is still much too high.

Notwithstanding all that has already been accomplished much remains to be done to secure a removal of dangerous substances in the air of factories, mills, and shops, such as flour, cotton, vegetable, and mineral dust. A larger and continuous supply of purer water, better and less crowded dwellings, are urgently needed, especially for the laboring classes. Intemperance and excesses of all kinds are known to have a very marked influence in raising the death rate. Speaking of the high mortality among publicans, Dr. Farr says: "There can be little doubt that the deaths will be found due to delirium tremens, and the many diseases noticed are aggravated by excessive drinking. The habit of indulgence is slow poison. The dangerous trades are made doubly so by excesses."

M. PLANTE'S NEW RHEOSTATIC MACHINE.

M. Gaston Planté, a well known French electrician, has recently studied the static effects of voltaic electricity by means of a secondary battery of 800 couples. After having observed how easy it was to charge rapidly with this battery an insulated plate condenser, the plate being thin mica, gutta percha, paraffin, etc., M. Planté connected a certain number of these condensers, composed of mica covered with tin plates. These he disposed like the couples of the secondary battery itself, so as to enable him to charge them in quantity and discharge them in tension.

All the parts of the apparatus were carefully insulated. The commutator was composed of a long cylinder of hard rubber, having longitudinal metallic bands which united the condenser surface and were traversed by copper wires bent at their extremities, the object being to associate the condensers in tension. Metallic wires made spring-shaped were connected with the two armatures of each condenser, and fixed on an ebonite plate at each end of the cylinder, which last may be rotated. "If now the end-conducting wires of the apparatus be brought into communication with the 800-couple secondary battery," says M. Planté, "even several days after the latter has been charged by two Bunsen elements, and if the commutator be rotated, there is obtained, between the arms at which the armatures of the extreme condensers end, a series of sparks quite similar to those given by electrical machines having condensers. By using an apparatus having but 30 condensers, each of 765 square inches of surface, I have obtained sparks 1.6 inch in length. By using a battery of 200 couples I have produced sparks 0.32 inch in length. The discharges of static electricity thus obtained are not alternately positive and negative, but are always in the same direction. Hence the loss of force resulting from transformation should be less than in induction apparatus, for, the voltaic circuit not being closed for an instant, there is no conversion of a part of the current into calorific effect. The machine may be kept in revolution for some time and a considerable number of discharges obtained without apparent enfeeblement of the secondary battery."

A Race of Pariahs.

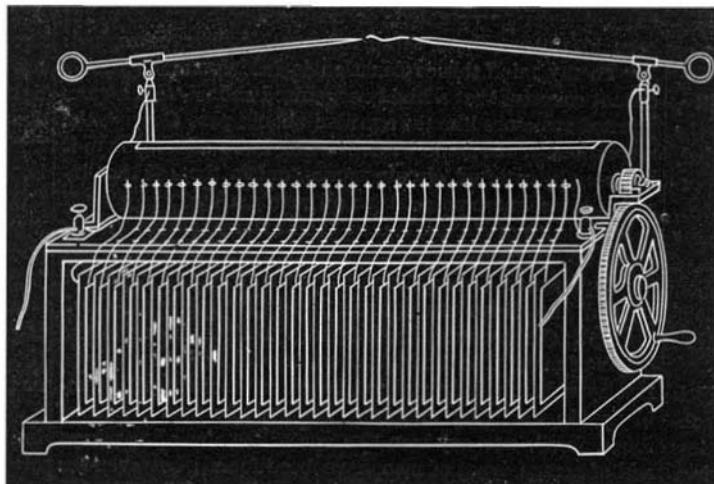
Since the middle ages the name of *cagots* has been given to a proscribed race of people dwelling chiefly on the northern slope of the Pyrenees. For centuries they have been objects of aversion to other inhabitants of the region. Possessing, it is said, bodily deformities of a repulsive nature, popular opinion among the peasantry once imputed to them the grossest crimes, compelled them to dwell in isolated localities, and to wear a distinguishing badge, denied them entrance to churches except by a special door, and forbade their participation in religious rites, or even their employment in factories or reception in religious refuges. They could not bear arms, walk barefoot, or drink from public fountains; their testimony in court was always doubted, and they were compelled to marry only among themselves. In this last particular they have always differed from leprosy colonies, where propagation of the race is interdicted, and hence, although through the progress of civilization public prejudice against these unfortunates has become greatly modified and they have been accorded many rights, still this anomalous people yet exists and constitutes an exceedingly curious study to the anthropologist.

The theories which have been advanced to account for their proscription are very numerous. One tradition ascribes their descent to the Visigoths conquered by Clovis at the battle of Vouillé, and derives their name from the French words *chiens Goths* (Gothic dogs); another makes them the descendants of crusaders who had returned from the Holy Land, infected with leprosy; another describes them as derived from a community excommunicated by Pope Innocent III. The fact, however, that all traditions agree in ascribing to personal repulsiveness a prominent reason for the isolation of these people, and that the treatment to which by long custom they are subjected is similar in many respects to that applied to lepers, indicates the possibility of some form of leprosy rarely seen at present being the true cause of their proscription.

A careful physiological study recently made by M. de Rochas, of all the settlements of *cagots* now existing in Europe, exhibits their condition at the present time and sheds

some light on their probable origin. M. de Rochas states that scarcely a village exists in the Pyrenees in which a certain quarter has not for a long period been regarded as set apart for the *cagots*, and that in the churches traces are yet visible of the doors devoted to them, although these portals are now walled up. The prejudice against the race is rapidly becoming effaced. Mixed marriages are more common, and the acquisition of fortunes has elevated the condition of individuals. In three large settlements visited there were very few characteristics observable on the part of the *cagots* to distinguish them from other inhabitants. Although in all cases mentioned in other visits their rights were curtailed, only one is mentioned where the condition of the race was such as to warrant their proscription, and in this they fully verified tradition in respect to physical and moral repulsiveness.

A curious fact regarding the *cagots* is that their habits and manners and language are always the same as those of the people with whom they reside. Other scattered races, no matter how widely disseminated, always retain some race individuality. The *cagots* are destitute of this, and thus theories attributing to them a common national origin are overthrown in favor of the hypothesis of leprosy. This terrible malady was chiefly brought into Europe from the East, and during the 13th century over 19,000 cases were known, 2,000 of which were in France. The disease remained endemic until the beginning of the 16th century, when it rapidly decreased, and now is practically unknown in all European countries excepting in Norway and the Grecian Archipelago. Two principal types of the malady are recognized: Elephantiasis, the true leprosy of the middle ages, and the so-called white leprosy, which is closely connected with albinism of the present time. Of albinism there are also two types, one depending upon a disease, the other being a phenomenon due to the stoppage of development of the coloring matter of the skin. M. de Rochas, who has examined all varieties of leprosy, has distinguished several forms of the disease affecting the *cagots*, ranging from its lightest manifestation, which simply shows itself in the



M. PLANTE'S NEW RHEOSTATIC MACHINE.

color of the eyes and hair, up to a horribly repulsive malady. Albinos caused by white leprosy, he states, have white hair and beards, blue eyes, and not red ones as phenomenal albinos possess, muddy skin, and epidermis more or less rough. There is an excessive predominance of the lymphatic system, and the body exhales a peculiar and disagreeable odor. No doubt appears but that this was the disease which affected the *cagots* of Europe, and which caused them at first to be confounded with the true lepers. The distinction was afterwards made, but the proscription of the former continued, despite the fact that their descendants gradually lost all traces of the infection.

New Agricultural Inventions.

A Moth Protector for Beehives, invented by Mr. J. P. Stroope, of Arkadelphia, Ark., is an attachment for preventing the entrance of millers and facilitating the cleaning of the hive. A hopper shaped sheet metal bottom has an oblong aperture, and below it is an inclined plate. The space between the bottom and plate is of sufficient width to permit a miller to pass, while it is insufficient to admit of the passage of a bee. The aperture to the hive is of sufficient size to admit the bees. The miller follows the plate, and being smaller than the bees passes between it and the bottom of the hive; while the bees, finding it impossible to follow this passage, enter the hive through the aperture mentioned.

Mr. Lyman Norton, of Hartford, N. Y., has invented an improved Harrow. It is square, having a jointed frame, provided with teeth, the draught being from one corner, as usual. In addition there is a toothed cross bar, braced by longitudinal keyed rods and supporting fingers.

A new Cultivator, invented by Mr. J. M. Graves, of Blossom Prairie, Tex., is so adjustable in its parts that the beams and plows may be fixed at any desired distance apart, and is capable of passing over tall plants without injuring them.

Mr. Wm. Smith, of Carmi, Ill., has invented certain improvements in that class of Ditching Machines which have a vertically adjustable plow or cutter, and an endless chain elevator connected therewith, for removing from the ditch the earth loosened and lifted by the plow. The improvements produce a comparatively light and simple machine.

A Reversible Plow, the invention of Mr. Peter Bouchet, of New York city, consists of a duplex share and mouldboard, made in one piece symmetrically to the center joint, swiveled centrally to an adjustable arm, and locked by perforations at both points to a fixed hook at the point of the landside. The colter is adjusted to either side of the point of the landside by a forked lever at the top of the beam, to correspond to the position of the duplex share and mouldboard at the right or left of the landside. The object is to furnish a side-hill plow by which the furrow slice may be turned to either side, as desired, so that the plow may be used while traveling in both directions.

New Mechanical Inventions.

An Apparatus for Hardening and Tempering Saws has been invented by Mr. S. E. Farmer, of Dayton, O. It consists, first, in combining, with a vertically movable anvil or press bed, a vertical follower and automatically releasing supports, by which a saw will be dropped into the bath at the proper time during the descending stroke of the follower and centered upon the press bed; secondly, in seating the press bed upon posts in the tub containing the bath, for the purpose of allowing the scales to fall free from the press bed without destroying its tension with respect to the follower.

An improved Machine for Cutting Horn into Sheets has been patented by Mr. M. M. Goldsmith *et al.*, of New York city. It consists of a grooved table with a fixed cutting knife, adjustable gauge plate, and a toothed or fluted feed roller above the gauge plate. The object is to furnish a machine which will cut the horn without injuring its surface.

An improved Cloth Shearing Machine, invented by Mr. A. A. Forbes, of Valleyfield, Canada, consists of a laterally reciprocating concave or grooved board, covered partly with a whalebone brush and partly with emery, and arranged above the guide roller over which the cloth runs before it passes to the setting-up brush.

Mr. W. S. Burgess, of Norristown, Pa., has invented an improved Air Pump, designed for running light machinery and for other purposes. A hand lever operates a piston rod carrying two pistons in a horizontal cylinder. Suitable inlet valves admit the air, and egress valves allow it to pass, when compressed, to the point where it is to be used.

Pinchers, designed for applying and securing barbs to fence wires, are the subject of a patent recently issued to Mr. J. W. Edwards, of Oswego, Ill. The handles of the tool are arranged to give a powerful leverage for bending the wires and barbs, and the jaws are provided with suitable grooves and projections.

In a Steam Engine, invented by Mr. Joseph Holub, of New York city, the arrangement of the valve mechanism is such that by turning off steam at any part of the stroke, the engine will always stop with the piston at the center of the stroke, thus avoiding the dead point.

Messrs. A. J. McCollum and Thomas Seely, of Indianapolis, Ind., have invented a Saw Mill Carriage Attachment, by which logs, after being quartered, can be cut up for barrel heads and staves the full length of the logs, the boards being then cut with butting-saws into pieces of the proper length.

Mr. Frank X. Osburg, of Cincinnati, O., has a Hand Press designed especially for compressing cigars, tobacco, and other articles, for packing them in boxes. It has a vertically movable follower, operated by a fulcrumed lever with curved ends, which engage the slotted arms of upright runners. The uppermost position of the follower is adjusted to the height of the box into which the articles are to be packed, so that the press cannot crush or injure the box, but only pack it tightly.

ASTRONOMICAL NOTES.

BY BERLIN H. WRIGHT.

PENN YAN, N. Y., Saturday, March 16, 1878.

The following calculations are adapted to the latitude of New York city, and are expressed in true or clock time, being for the date given in the caption when not otherwise stated.

PLANETS.			
	H.M.		H.M.
Mercury rises.....	6 13 mo.	Saturn sets.....	5 47 eve.
Venus rises.....	4 28 mo.	Uranus in meridian.....	10 17 eve.
Mars sets.....	11 23 eve.	Uranus sets.....	5 09 mo.
Jupiter rises.....	3 49 mo.	Neptune sets.....	9 20 eve.
FIRST MAGNITUDE STARS.			
	H.M.		H.M.
Antares rises.....	0 27 mo.	Alpheratz sets.....	8 15 eve.
Regulus rises.....	3 40 eve.	7 stars (cluster) sets.....	11 31 eve.
Spica rises.....	8 18 eve.	Rigel sets.....	11 01 eve.
Altair rises.....	1 40 mo.	Sirius in meridian.....	7 02 eve.
Vega rises.....	10 01 eve.	Procyon in meridian.....	7 55 eve.
Deneb rises.....	11 03 eve.	Arcturus in meridian.....	2 35 mo.
Algol (var.) sets.....	0 35 mo.	Capella in meridian.....	5 30 eve.
Aldebaran sets.....	11 49 eve.	Betelgeuse in meridian.....	6 11 eve.

REMARKS.

The sun enters the sign Aries and the constellation Pisces March 20, 0h. 46m. evening, at which time Spring begins. Mercury is at superior conjunction March 20. Venus will soon be very brilliant. Mars is situated between the Pleiades and Hyades and nearest the former. There will be an eclipse of Jupiter's fourth satellite March 18. The disappearance takes place at 5h. 28m. morning, at twice the apparent diameter of Jupiter west, and somewhat south of its primary. The duration of the eclipse is 3h. 40m., hence the emersion is not visible. For an inverting telescope the above directions would be reversed.