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DEATH BY ELECTRICITY-THE NEW LAW OF NEW YORK.
The new law of the State of New York, ordering death by electricity as the punishment for capital offenses, went into effect January 1st. So radical a change in the administration of the ultimate penalty will probably give rise to delays in the administration of justice. Certain clauses in the constitution will afford the counsel of criminals on trial for murder a pretext for holding the law unconstitutional.
Assuming the constitutionality of the law to be perfect and proved, are the sheriffs and prison officials of the State prepared to inflict the punishment? The very crudeness of hanging brought it within the scope of the commonest type of executioner. But the new method deals with one of the most refined and least understood sciences. Experiments have already been made upon dogs and other animals. A wide variation in personal coefficients of resistance and susceptibility to the current has been found to exist in them. The condition of the skin is the predominating cause of the first variation. A man whose body is warm from exercise and who has a strong perspiratory action will be of lower resistance current will vary according to the nervous condition of the subject. This is an element which cannot be included in experiments on the lower animals. A criminal led to execution may be in a state of nervous tension that will very seriously modify the operation of electric shock. A perfect and certain method for the electrical slaying of human beings has not yet been evolved.
Every prison where the law is carried out must be supplied with the most perfect electrical plant. Every connection must be of the best, and all must be kept in perfect order. The effects of disuse, the hardest of all deteriorating causes to combat in their influence upon machinery, must be guarded against. All this apparatus may stand idle from year to year, only to be used on the rare occasions of an execution.

To apply and run the apparatus and to inspect every detail, a skilled electrician will be required. The voltage must be accurately determined, the number of alternations of current per second must be known, if the alternating current is to be used, and the resistance of the person to be killed should be determined. There should be no chance of a failure, and all must be definite and known. It remains to be seen whether a competent person will undertake a duty to which some measure of odium will inevitably attach.
The successor of the present hangman can be depended on to make the fatal contact, but that is all. The electrodes must be attached to the person by or directly under the superintendence of the electrician. The struggles of the prisoner, by disturbing the position of the electrodes, may bring about the most deplorable results. As it is now, far too many executions by hanging fail in the end of quickly killing with little suffering. But where the vastly more complicated mechanism of an electric plant is depended on, the possibilities of a failure are largely multiplied.
Death has been administered to dogs by suffocation in coal gas with perfect success. This death, as far as can be known, is absolutely painless. The writer has several times been rendered totally insensible by inhaling gas, and can testify to the efficacy of the anæsthesia produced. Under its influence a perfectly quiet jrelapse into unconsciousness ensues, the last memory of events being clear and unclouded. Some such method of inflicting the death penalty would seem far in advance of the electric process. There would be a quick and painless unconsciousness, and the exposure could be so long as to insure a fatal result. It could be applied in an ordinary cell, with no special apparatus, and could even be applied to the criminal while sleeping. It would, above all, be infallible and certain, and would not mar or deface the body. The latter is alwould not mar or deface the body. The latter is al-
wass liable to happen with electricity. ways liable to happen with electricity.
But the law has been passed and no provision has
been made to carry it out. Apparatus is not provided, no competent specialists have been appointed to superintend its administration, and in the present state of affairs, the present law appears to amount to little more than an indefinite suspension of the death penalty for murder.

## Elastic Traces.

Every one has noticed that a dray horse is often obliged to use all his weight and strength to start a vehicle which moves along easily enough when once set in motion, and it is quite conceivable that springs in the harness might make the work easier by distributing the movement of starting over a longer period of time. Acting on the suggestion of M. Celler, chief engineer, the directors of the Eastern Railway of France began, six years ago, to harness all the horses employed in shifting freight cars at their Paris station with traces made of chains having a strong spiral spring inserted in them. A large number of horses is employed in this service at the station, and the effect of the change has been very satisfactory. A considerable gain has been made in the durability of the harness
and the regularity of the work, through the diminu-
tion of the number of chains broken in the st vice, while the horses have done their work better and vice, less fatigue. The blow of the collar on the should at starting is far less violent and less injurious to th animal than under the old system, and the horses, finding that a strong continued pressure will effect as much as the jerk which was formerly necessary, seem to gain courage, and pull steadily and directly, instead of wasting their strength in ineffectual plunges During the six years of trial the directors of the com pany have become so convinced of the superiority of the new mode of harnessing that it has been adopted in all portions of the vast network of lines under their control.

## POSITION OF THE PLANETS IN JANUARY.

## venus

is evening star and holds the first rank on the planetary annals of the month for her surpassing brilliancy. She is still moving eastward from the sun. and has so increased in size that her diameter, which was $10^{\prime \prime}$ when she became evening star, on July $i 1$, is $20^{\prime \prime} .6$ at the close of the month. Venus and Mars are both in conjunction with the moon on the evening of the 4th, the crescent being south of the planets. The southwestern sky will then present a charming picture soon after sunset. Venus sets on the 1 st at $7 \mathrm{~h} .56 \mathrm{~m} . \mathrm{P}$. M. On the 31st she sets at $9 \mathrm{~h} .0 \mathrm{~m} . \mathrm{P}$. M. Her diameter on the 1st is $16^{\prime \prime} .2$, and she is in the constellation Capricornus.
is evening star and ranks next to Venus on account of his close companionship with his peerless rival at the beginning of the month. Observers who have watched the approach of the two planets during December will be specially interested in their conjuction on the 2 d , at 7 h .47 m . A. M. This, of course, is invisible, $t \cdot t$ on the evening of the 2d Mars will be west of Venus, showing that she has overtaken and passed her ruddy neighbor. Mars sets on the 1 st at $8 \mathrm{~h} .1 \mathrm{~m} . \mathrm{P} . \mathrm{M}$. On the 31st he sets at $8 \mathrm{~h} .5 \mathrm{~m} . \mathrm{P} . \mathrm{M}$. His diameter on the 1st is $5^{\prime \prime} .2$, and he is in the constellation Capricornus.

## SATURN

morning star, and holds a prominent place on the January annals. He must be looked for in the northeast, where he will be seen rising on the 1st ubout half past 7 o'clock in the evening, followed half an hour later by Regulus in the handle of the Sickle. He makes a fine appearance, having nearly reached his brightest phase. Saturn rises on the 1st at $7 \mathrm{~h} .37 \mathrm{~m} . \mathrm{P}$. M.'. On the 31st he rises at 5 h .28 m . P. M. His diameter on the 1st is $18^{\prime \prime} .8$, and he is in the constellation Leo.

## mercury

is evening star. He reaches his greatest eastern elongation on the 30th, and at that time, and for a week before and after, is visible to the naked eye in the west. He must be looked for three-quarters of an hour after sunset, about $7^{\circ}$ north of the sunset point. Mercury sets on the 1st at $4 \mathrm{~h} .35 \mathrm{~m} . \mathrm{P} . \mathrm{M}$. On the 31st he sets at $6 \mathrm{~h} .41 \mathrm{~m} . \mathrm{P} . \mathrm{M}$. His diameter on the 1 st is $4^{\prime \prime} .6$, and he is in the constellation Sagittarius.

JUPITER
is morning star, and, before the month closes, will be a conspicuous object in the morning sky, rising in the southeast, more than two hours before the sun. Jupiter rises on the 1st at 6 h . $5 \mathrm{~m} . \mathrm{A}$. M. On the 31st he rises at 4 h .34 m. A. M. His diameter on the 1st is $30^{\prime \prime} .2$, and he is in the constellation Sagittarius.

## URANUS

is morning star. He is in quadrature with the sun on his western side on the 11 th at $4 \mathrm{~h} . \mathrm{P}$. M. Uranus rises on the 1st at 0 h .58 m. A. M. On the 31st he rises at 11 h. 1 m. P. M. His diameter on the 1st is $3^{\prime \prime} .6$, and he is in the constellation Virgo.

## NEPTUNE

is evening star. He sets on the 1 st at $4 \mathrm{~h} .11 \mathrm{~m} . \mathrm{A} . \mathrm{M}$. On the 31st he sets at $2 \mathrm{~h} .11 \mathrm{~m} . \mathrm{A}$. M.

Mercury, Venus, Mars, and Neptune are evening Jupiter are morning stars.

## Illiterates.

A census of the illiterates in the various countries of the world, recently published in the Statistische Monatschrift, places the three Sclavic states of Roumania, Servia, and Russia at the head of the list, with about 80 per cent of the population unable to read and write. Of the Latin-speaking races, Spain heads the list with 63 per cent, followed by Italy with 48 per cent, France and Belgium having about 15 per cent. The illiterates in Hungary number 43 per cent, in Austria 39, and in Ireland 21. In England we find 13 per cent, Holland 10 per cent, United States (white population) 8 per cent, and Scotland 7 per cent, unable to read and write. When we come to the purely Teutonic states, we find a marked reduction in the percentage of illiterates. The highest is in Switzerland, $2 \cdot 5$, in the whole German Empire it is 1 per cent; in Sweden, Denmark, Bavaria, Baden, and Wurtemberg there is practically no one who cannot read and berg the.
write.

