Rural Economy.

NEW METHOD OF CURING MEATS FOR FOOD.

Not only in man, but in all the higher developments of animal life, there is found a connecting system of arteries, veins and capillaries traversing every portion of the body, even to its remotest issue; and that through these there is a constant circulation from the heart as a focal centre, and back again. We know, too, that the current of this circulation is sent from the left ventricle of the heart through the arteries and capillaries to every fibre of the body, and thence back through the veins. Physiologists tell us that these circuits are made in from ten to twenty-five seconds, and that all the blood in the human system passes through the heart at intervals varying from 1¼ to 2¾ minutes.

Reasoning from these premises, the discovery was long since made that by introducing a strong liquid antiseptic into the left ventricle of the heart of the human body, after death, and while the continuity of the circulating organs remained unbroken, it would permeate the whole system, driving the blood before it, and result in a kind of temporary embalmment This was practiced to some extent before and during the war, in cases where persons had died of sickness, far removed from their homes, in order to enable friends to transport their remains long distances, involving unusual delays in burial.

Our attention was recently called to a novel and important application of this fact, and to witness several entirely satisfactory demonstrations of its successful application to the curing of meats for food. The process is exceedingly simple, and consists in using the natural organism provided for the circulation of the blood as a conduit for the infusion of pure brine into the animal. The method has been in daily use at an extensive slaughter-house in Buffalo, for several months past, and is pronounced a decided success by all who have witnessed it. It applies equally well to cattle as to swine, although the demonstrations witnessed by us were confined to the latter. The animal is rendered senseless by a blow on the head, is brought to the edge of the scalding vat, and laid upon its back. The operator makes an incision just back of the forelegs, laying the *sternum* or breast-bone bare. Then he saws through the bone, exposing the heart to full view, which he pierces with a sharp instrument, causing the arterial blood to spout. With very little loss of blood, the dead animal is plunged into a vat of hot water, and after soaking for a minute or two, is delivered by neatly-contrived machinery upon a table, where his bristles are removed, and he is presently dangling by his heels a closely-shaven and cleanly corpse. In this condition he is lowered by machinery into a room below, where he is placed upon another table to be salted. Over this table, at the height of eight or ten feet, is placed a reservoir, of strong, cold brine, keeping the temperature of thirty-two degrees, into which are inserted rubber tubes terminating in small metallic pipes. An orifice having been made into the left ventricle of the heart, one of these pipes is inserted into it and tied, and the brine flows into the channels of circulation, driving the blood before it and out of the incision in the heart itself. As soon as the blood ceases to flow, a full circulation of brine has taken its place, and in from eight to ten minutes the the flesh is sufficiently impregnated with salt to warrant its being immediately sent to market. The animal is then disembowelled, cut up, and the product disposed of in the usual way. Those portions designed for smoking are submitted to that process at once, and the rest is either packed or dry-salted, as may be desired.

The great features of this process of curing meat for food are that it may be used in all seasons of the year and in all climates; that it is simple and easy in its application, requiring no peculiar skill and no expensive or complicated machinery; and last, but not least, that it obviates the the customary delays in getting the product to market which is involved in the old process, and thereby largely reduces the amount of active capital necessary to carry on the business. This new process also seems to us to be destined to become a valuable agency to the world's economy in warm climates.

In the greatest cattle-raising regions of the two American continents—the plains of Texas, Mexico and California, and the Pampas of South America—beef is preserved with great difficulty. Texas herds are obliged either to find their way North in droves to be slaughtered, thereby involving great expense and risk, or they are sold at from five to ten dollars a head and slaughtered solely for their hides and tallow. This latter is done almost exclusively in Mexico and Brazil, thus causing an immense waste of choice food every year.

Our own enormous corn production and the high cost of transportation have necessarily resulted in its large conversion into the more concentrated form of pork, in late years; and the consequence has been that the cattle and pork interest of the country has been developed into such enormous proportions that it now ranks second only to that of breadstuffs in value and importance. This development must continue to go on in the future, even more rapidly than it has in the past, and cannot fail to be stimulated by the economic process which we have been considering.

The valuable discovery was patented in 1858, by Dr. N. B. Marsh, of Cincinnati, and the patent for the whole United States is owned exclusively by Col. William C. Ellberger, of Buffalo.—*Buffalo Paper.*

BOTS IN HORSES.

One of our most valuable horses died, a few nights since, by a sudden attack of terrible distress in the stomach The cause of his death was supposed to be the bots, and on *post mortem* examination, these animals were found in great numbers in his stomach. A patch was cut out and exhibited at the house, on which the ugly-looking creatures swarmed as thickly as they could lie together, each of them with his tethering and hooked beak plunged in the coat of the stomach. A place as large as the palm of one's hand was completely covered with them, and by the side of that was a patch nearly as large, from which the inside coating of the stomach was entirely eaten away.

The victim, in the present instance, had been in good health till within a few hours of his death. He had done a rather hard but not unusual day's work on a warm day, and thereupon at night fell sick, showed signs of terrible distress in the stomach, and died before morning. *Post-mortem* examination showed that corrosions of the coat of the stomach killed him, and greedy swarms of bots were close by the corrosions, with their heads burrowing in the flesh.

On these facts our common sort of observers raise the theory that the bots, being always present, more or less, in horses, are usually content to feed on the contents of the stomach, or the mucus of its coatings, in a harmless way; but when, by over-work or other causes, the horse is weakened, and incipient inflammation takes place in the stomach, they fall to and incontinently devour the very walls of the house in which they dwell.

Whether this theory will stand proof or not in respect to bots, I am satisfied that it is substantially a true representation of the operations of many other parasites. Their way is to remain harmless and unperceived in ordinary states of the health of their victims, and to seize the opportunity of some incidental weakness, to bore into the vitals and insure death.—*Oneida Circular.*

Scientific.

LECTURES BEFORE THE YOUNG MEN'S CHRISTIAN ASSOCIATION.

GEOLOGY.

BY THEODORE D. RAND, ESQ.

A few evenings since, a most interesting lecture on Geology was delivered by Theodore D. Rand, Esq., who displayed not only love for the science, but a proficiency in it, combined with the happy faculty of making everything plain to the class, and infusing into his hearers a portion, at least, of his enthusiasm in its pursuit. He exhibited specimens taken from the various geological formations, so that his audience could readily understand what he was talking about. He gave a rapid view of the elements of the science, the various strata forming the earth's crust, the order in which they invariably occur, and the generally accepted views in regard to the mode of deposit and upheaval. He then gave a full description of the origin of the coal formation, the vast shallow lakes of former ages filled with a dense growth of ferns, growing much more rapidly then than similar plants do now, filling the lakes with their tangled growth, and year after year accumulating the immense deposits which were, in the course of time, depressed and covered with an earthy stratum. There is a succeeding age of rest, another series of vegetable growth takes place, again sinking and being covered with a deposit of water-worn stones and mud, the whole forming the strata of coal with their covering of conglomerate rock. The coal mines and mining then went in rapid review before the class—making up a lecture of the scientific combined with the useful.

It is not often that our *attorneys* give their attention to scientific pursuits. In Mr. Rand we have the rare instance of a thoroughly scientific mind pursuing the daily routine of an active legal business. He also *runs* a flourishing mission school on the Sabbath—certainly a busy man.

THE BAROMETER.

BY PROF. P. E. CHASE.

On Friday evening last, the subject was the Barometer, which the lecturer said was discovered in the days of Galileo, about the same time as the telescope. The instrument was suggested to some Italian workmen, who, in putting a pump down a deep well, discovered that they were unable to suck water higher than thirty-two feet—above that height, the pump-barrel continued empty. This led to the discovery that the atmospheric pressure was equal to that of a column of water thirty-two feet high, or of mercury (being thirteen times as heavy) one-thirteenth as high, or about thirty inches. Atmospheric pressure became the subject of investigation among all the philosophers of Europe, and soon the above results were verified. The changes of the mercury column were, however, attributed to witchcraft, in some instances, as their accuracy in predicting changes of weather became known. The mechanism of the instrument, with the various methods of obtaining accuracy and sensitiveness, were explained; together with the reason why a dry, heavy atmosphere caused the column to rise, and a moist, more *steam-like* air, was lighter and caused a fall in the column.

The fact that a large number of observations of Barometers in various observatories had been taken for several years, at the same hours, by scientific men at, say Greenwich, St. Helena, Philadelphia and elsewhere, was then stated. The result confirmed the general law, that at 10 o'clock A. M. all the Barometers rose, at 4 P. M. they fell, at 10 P. M. they rose again, and at 4 A. M. fell; showing a change in the density or the height of the column of air four times daily, and at regularly stated periods—a tide in the air, rising and falling even more regularly than the tides of the ocean.

For twenty-five years past these facts have been before our scientific students, and the cause is at last discovered and proven to be the unequal velocity through space of the different sides of the earth's surface at the different hours of the day. The velocity is made unequal by the backward motion of the one side of the earth around its axis, while the other side is moving forward, the whole body in the meantime pursuing its constant path around the sun.

This unequal velocity gives a tendency to the air to *pile up* at one part of the daily revolution, while it is depressed and of less height at another; causing these daily and regular tides. From these data, it has been ascertained that, by the Barometer, the *weight* of the air, as well as of the earth, can be ascertained, and from these data again the distance from the earth to the sun can be accurately measured. This brings us to the fact that, after two hundred and fifty years, the use of the Barometer is made to prove the accuracy of the telescope, and it becomes a curious fact that they were both discovered simultaneously, in the same locality, and for two hundred and fifty years have been watching each other without the world knowing it. The distance of the earth from the sun, he explained, is proven by watching the eclipses of Jupiter's moons when the earth is nearest to that planet, and then again, six months afterward, when farthest from it. The difference in the time occupied by the light in travelling from Jupiter to the earth in the two different observations being some sixteen minutes, and requiring a space to be travelled of one hundred and eighty-four millions of miles greater in one instance than the other. This space is the diameter of the earth's orbit. It is six millions less than the generally received number, and its accuracy is proved by the Barometric observations.

These truths lead us to the most sublime manifestations of the Creator's power, to whose mind all these vast distances, these intricacies of scientific research, are as plain as our alphabet is to us.

The lecturer, Prof. Chase, was as easy and pleasant in his delivery as though engaged in conversation with a friend. He was so animated, as he brought out these hidden conclusions, that the class came down in applause as he reached them—showing that his animation was contagious.

Lectures like these, while they interest and instruct, must tend to elevate the crowds of young men who weekly attend them. We learn that there is in store a fine lecture by Professor *Hayden*, recently returned from the plains of Kansas and Colorado, where he has been pursuing scientific research; also from our renowned chemist, Professor R. E. Rogers, on the Philosophy of Combustion.

A STAR ON FIRE.

BY EDWIN DUNKIN, OF THE ROYAL OBSERVATORY.

About the middle of May last, astronomers were startled by the announcement that a new star of considerable brightness had suddenly burst forth in the constellation Corona Borealis, (the Northern Crown.) Its increase of magnitude must have been extremely rapid, for on the 9th of May an observer, who was occupied that day in scrutinizing that portion of the heavens, felt certain that no object comparable to it was visible. On the twelfth, three days afterward, the star shone with the brilliancy of one of the second magnitude, or equal to the three well-known stars in the belt of Orion. The important results obtained from the observation of this truly extraordinary astronomical object are sufficient reasons for our giving a brief and popular account of its short history, which we are sure will be duly appreciated by our scientific readers.

The first person who appears to have noticed this new variable star was Mr. J. Birmingham, of Tuam, Ireland, who observed it May 12th. Subsequently it was seen on the 13th, at Rochefforts, by M. Courbebaisse, and on the same day at Athens, by M. Schmidt; on the 14th it was noticed at London, Canada West, by Mr. Barker, and on the 16th at Manchester, by Mr. Baxendell. These observers saw it independently, without any previous notification. Attention being now drawn to the star, it has since been regularly observed, either for position or for the inquiry into its physical constitution, at most of the public and private observatories in Europe and America. Its brightness rapidly diminished after discovery, but probably not in the same ratio as it had increased before. The relative magnitudes, determined by comparison with neighboring known stars, are as follows:—

May 12,	2	magnitude.
" 15,	3 5	"
" 18,	4 8	"
" 21,	6 7	"
" 24,	7 8	"
" 30,	8 8	"

Very little change had taken place from May 30th to June 22d. On the evening of the latter day the magnitude was reckoned as the ninth.

So far, this discovery would not probably have attracted any greater attention than that of any ordinary variable. The new star would most likely have been followed very closely only till the extent and period of its variability were satisfactorily established. Of such objects the firmament contains many extraordinary examples; stars which appear for a season and then disappear, again reappearing, performing in the meantime all their changes of brightness with perfect regularity. While there are some which complete their period in days, there are others occupying months, or perhaps years, between the intervals of maximum magnitudes. If our new star had been, therefore, simply one of this class, interesting though it might have been from the abruptness of its first appearance, it would merely have added one to the list of those known variables which are to be found scattered here and there among the fixed stars.

But astronomical observations have unfolded other properties peculiar to this star, giving us an insight into physical composition different from that of others around it. This has been attained from the observation of its spectrum, as viewed through a spectroscope attached to an astronomical telescope.

On looking at an ordinary star through a spectroscope, its spectrum is seen with transverse dark lines across it, similar to Fraunhofer's lines in the solar spectrum. Some of these are common, or nearly so, in most stellar spectra; while each star has generally, in addition, its own peculiar dark lines. This would seem to show that whereas certain metals or gases are indicated as being present in the majority of stars, each one contains materials peculiar to itself. Now this marvellous star in Corona Borealis, which has so astonished us all, has not only the ordinary stellar spectrum with the *dark* lines across it, but there is also a second spectrum, apparently superposed upon the other, in which four or five *bright* lines have been observed. Mr. Huggins, who has devoted his whole astronomical attention to this class of observation, has, in conjunction with Dr. W. A. Miller, concluded that the light of the star is compound in its nature, and that it has really emanated from two different sources. Hr. Huggins remarks that "each light forms its own spectrum. The principal spectrum is analogous to that of the sun. The portion of the star's light represented by this spectrum was emitted by an incandescent solid or liquid photosphere and suffered partial absorption by passing through an atmosphere of vapors existing at a temperature lower than that of the photosphere. . . . The second spectrum, which in the instrument appears on the one already described, consists of five *bright lines.* This order of spectrum shows that the light by which it was formed was emitted by matter in the state of gas rendered luminous by heat." Independent observations, made at the Royal Observatory, Greenwich, principally by Mr. Stone and Mr. Carpenter, and at the Imperial Observatory, Paris, by MM. Wolf and Rayet, gave results confirmatory of those made by Mr. Huggins and Dr. Miller.

Such, then, is a brief account of the analysis of the light emitted from this temporary but brilliant visitor to our sky; showing with little doubt that, from some cause unknown to us, it must have been the subject of a terrible catastrophe at a period perhaps distant; for it must be borne in mind that, owing to its immense distance from us, we may be only witnessing the calamity of a past age. From the sudden blazing forth of this star, and then its rapid fading away, Mr. Huggins and Dr. Miller have suggested that, in consequence of a great internal convulsion, probably a large quantity of hydrogen and other gases were emitted from it; "the hydrogen, by its combination with some other element, giving out the light represented by the bright lines, and at the same time heating to the point of vivid incandescence the solid matter of the photosphere. As the hydrogen becomes exhausted, all the phehomena diminish in intensity, and the star rapidly wanes." That hydrogen gas in a state of combustion was present, is very probable; for, by comparing simultaneously the bright lines of the stellar spectrum with those of hydrogen produced by the induction spark, taken through the vapor of water, it was found that two of the lines sensibly coincided. During a discussion on this star, at a meeting of the Royal Astronomical Society, on June 8th, the astronomer royal expressed his firm belief that this wonderful object was actually in flames.

If we were inclined to speculate on this unique astronomical phenomenon, or the probable consequences arising from such a sudden outburst of fiery gas, what an extensive subject for contemplation it opened to us. Astronomically we have known this minute star for years without suspicion; it has been classified with others of similar magnitude; it has been one of many millions of such; while now it will be remembered by all future generations as one of the most extraordinary among the most celebrated stars of the universe. Or, let our speculation be carried a little further, and let us reasonably suppose this small and hitherto nearly invisible object to be an immense globe like our own sun, and surrounded probably with planets and satellites depending upon their centre for light and heat; what would be the effect of this sudden conflagration on them? It makes one almost shudder at the idea of a system of worlds being annihilated at once without warning. But such must doubtless be the fact. We, however, in this quiet world of ours, can scarcely, perhaps, realize such a catastrophe; but were our sun, which is only a star analogous to those in the heavens around us, to be suddenly ignited in a smilar manner to this distant and unknown sun, all its attendant planets and satellites, the earth included, would be destroyed.—*Leisure Hours.*

Miscellaneous.

Insurance Companies.