

to occupy twice the volume predicted by theory, — in other words a given volume of the vapor exerts twice the theoretical pressure. The explanation is easy when we learn that the salt is dissociated into the two gases, ammonia and hydro-chlorine acid. Similar anomalies in osmotic pressure may lead to a similar interpretation, although quite antagonistic to our ordinary conceptions and teachings. Sodium will burn in chlorine with striking evolutions of light and heat; we recognize the product as a new substance. Chemical action has taken place. By a large expenditure of energy the elements may again be separated; this also is chemical action. But we dissolve the salt in water, evaporate, recover it as before, and are prone to count all these changes as purely physical. Little do we suspect that the dilute solution contains in free state the two substances which we usually know as metal and gas, the two kinds of atoms moving independently of each other, so long as they are distributed in equal numbers in any portion of the fluid. Yet such is the theory of Arrhenius, now fast gaining ground. Cold water decomposes a most stable compound, the elements being gradually reunited in evaporation and crystallization. Accept this hypothesis for electrolytes and their peculiar properties are explained, their additive character must follow as a necessary consequence of their nature, and the several kinds of anomalies fall into harmonious relations.

On this hypothesis the speed of chemical change should no longer be proportioned to the whole quantity of each active substance present, but rather in proportion to that part which has already suffered loosening of the bonds. The facts of dynamical chemistry afford an independent and valuable confirmation of the new views.

#### THE ORIGIN OF THE ASS, THE CAT, AND THE SHEEP IN CHINA.<sup>1</sup>

At a recent meeting of the China Branch of the Royal Asiatic Society in Shanghai, Dr. Macgowan, a well-known Chinese scholar, read a paper on the probable foreign origin of the ass, the cat, and the sheep in China. He said that the Chinese, in their numerical co-ordination of concrete and abstract nature, give the "six domestic animals" as the horse, ox, goat, pig, dog, and fowl; which seems to indicate that when that formula was framed, neither cat, sheep, nor ass had been domesticated there. When familiar beasts were selected to denote years of the duodenary cycle, to the "six domestic animals" were added the rat, tiger, hare, dragon, serpent, and monkey, to complete the dozen, as if the ass, sheep, and cat were too little known to meet the object in view, which was the employment of the most familiar representations of animated nature for the duodenary nomenclature. Still more striking is the absence of the ass, sheep, and cat from the twenty-eight zodiacal constellations, which are represented by the best-known animals.

With regard to the ass, there is ample reason to regard it as being excluded from the list of domestic animals because it was not archaic. The hybrid mule is of comparatively modern origin in China, dating back only about a score of centuries. A miscellany of the Sung era states that "the mule was not seen during the Hsai, Shang, and Chou dynasties; that it was a cross between the ass and horse from Mongolia. It is regularly bred in the north, and is worth in the market twice as much as the horse; it is popularly reported that its bones are marrowless, which is the reason of its inability to produce its kind." Again, it is recorded in a Ming

<sup>1</sup> From Nature.

cyclopædia: "The mule is stronger than the horse, and is not a natural product of China; in the Han era it was regarded as a remarkable domestic animal." Is it likely that, if the ass existed during the three ancient dynasties, there was no crossing with the horse?

With regard to the cat, Dr. Macgowan proceeded to state that there was a quotation from a standard work which discloses the fact that Yuang Chuang, the pilgrim monk, who, in the seventh century A.D., returned after sixteen years' wanderings in India, brought cats with him to protect his collection of Sanscrit Buddhist books from rats. That account, however, is somewhat invalidated by an anecdote of Confucius, who is related to have one day seen a cat chasing a rat. These conflicting statements are from authoritative sources, and it is impossible to offer a satisfactory explanation. Possibly the cat of Confucian times was only a partially domesticated wild cat. There must have been some ground for the statement of the cat having been brought from India, as it is hardly likely that in all the long period of Chinese history it should be named but twice as a domestic animal. He quotes from Chinese folk-lore on the subject of cats. As cruelty to cats and other animals is followed by retribution, so services rendered to them meet with supernal recognition. As anciently the tiger was sacrificed to because it destroyed wild boars, so the wild cat was worshipped because it was the natural foe of rats; boars and rats being the natural enemies of husbandry. At the commencement of the Sui dynasty, A.D. 581, the cat spirit inspired greater terror than the fox did subsequently. The hallucinations of cat spirit mania prevailed, forming a remarkable episode in Chinese history, only to be likened to the fanatical delusion of witchcraft that frenzied Europe a thousand years later. It was believed that the spirit of a cat possessed the power of conjuring away property from one person to another, and inflicted through incantations bodily harm. The popular belief was intensified and spread like an epidemic, until every disastrous affair that took place was ascribed to cat spirit agency set in motion by some mischievous enemy. Accusations were lodged against suspected persons, and, the slightest evidence sufficing for conviction, the malicious were encouraged to trump up charges against the innocent, until the country became a pandemonium. No one was safe, from the Imperial family down to the humble clodhopper. Even a magnate of the reigning house, who enjoyed the titular distinction of Prince or King of Szechuan, was executed for nefariously employing the agency of cat spirits. In this manner several thousands were immolated before the delusion was dispelled. Happily the period appears to have been of brief duration: incentives such as kept up the witch mania for centuries were wanting in China. Coming down to our own times we find a cat-craft delusion prevailed over a great portion of Chêkiang. "In the summer and autumn of 1847 frightful wraiths appeared throughout the departments of Hangchow, Shaohsing, Ningpo, and Taichow. They were demons and three-legged cats. On the approach of night a foetid odor was perceptible in the air, when dwellings were entered by something by which people were bewitched, causing alarm everywhere. On detecting the effluvium in the air, householders commenced gong-beating, and the sprites, frightened by the sonorous noise, quickly retreated. This lasted for several months, when the weird phenomena ceased." Well did he remember, said Dr. Macgowan, the commotion that prevailed in Ningpo throughout those months of terror. Every gong that could be procured or manufactured for the occasion was subject to vigorous thumping

through the livelong night, maintained with vociferations by relays of zealous beaters. This deafening din was but a recrudescence of what had occurred a few generations before—a panic which was only exceeded by that which subsequently prevailed over the entire empire.

With regard to sheep, Dr. Macgowan said the ancient mode of writing the character for *yang*, goat, was ideographic—four strokes on the top to represent horns, two horizontal strokes representing legs, and a perpendicular one to represent body and tail. The modern form gives an additional parallel stroke, like the word for horse; it is a simple, not a compound character, and when sheep came to be known, instead of making a new character, the sheep was called the “Hun-goat,” thus indicating its origin and affinity. *Yang*, goat, is often translated sheep, the earliest instances being found in one of the Odes, wherein the court habiliments of Wen Wang are called “lamb-skins and sheep-skins.” This was about 1160 B.C., but it is doubtful if these robes are really the skins of sheep. It is not certain that such was the case, for the skins of goats were used then, as now, for clothes. Hun-goats are not named before the period of the Tang dynasty, say the seventh century A.D. The goat was one of the sacrificial animals, as at present, and was at the first selected for sacrifice when sheep were unknown.

In the discussion which followed, the conclusions of the paper were not accepted by all the speakers; and it was agreed that the subject was one worthy of scholarly investigation.

#### NOTES AND NEWS.

THE international Statistical Congress, which met at Vienna in October last, selected the city of Chicago and the summer of 1893 as the place and date of their next meeting, and a committee was appointed to draw up a report on the question of emigration, which is to be discussed at that time.

—It is said that two pieces of aluminium can be soldered together with ease by using silver chloride as a fuse. The pieces of metal are placed together in their proper relative positions, and finely powdered fused silver chloride spread along the line of junction, after which the solder is melted on with a blow-pipe.

—Professor E. A. Fuertes, director of the New York State Weather Bureau, Ithaca, offers to send telegraphic notice of cold waves to such persons in New York State as will display the regulation signals for the benefit of the public. This bureau works in co-operation with the Washington office. A limited number of flags will be furnished by the Ithaca office, and those applicants who cannot be thus supplied will be given a list of dealers from whom the flags may be obtained. The flags, which are of bunting material, may also be made by the persons using them.

—A mine of coal of very fair quality for steaming purposes has been found by accident in the Straits of Magellan, according to *Engineering*. Signor Fossetti, the captain of an Italian steamer, was compelled to anchor in Shagnet Bay to make some repairs, and while there he discovered coal very near the surface. Reaching Valparaiso, he sent a corps of experts to the scene of the discovery in a steam launch, who found that the coal was not only abundant but of excellent quality. The importance of the discovery to the commerce of the world can only be appreciated when it is considered that all steamers passing through the Straits of Magellan are required to coal there, and that the supply has heretofore been brought from Cardiff, Wales.

—According to observations made at recent meetings of the Berlin Medical Society, it would seem that the epidemic of influenza began there during the first week of November, the earliest cases admitted into hospital having come under treatment on Nov. 7. Ruhemann stated that the most noticeable difference

between this and the other recent epidemics has been the large number of women and children, and the small number of outdoor workers attacked. Guttman mentioned an instance in which the admission of a single patient suffering from influenza was shortly followed by the occurrence of 13 fresh cases. Fränkel, who took notes of 138 cases, found that only 9 (6.5 per cent) had suffered from the disease before. The chief complications have been pneumonia and heart failure. The effect on the death-rate in Berlin has not been so marked as during the last epidemic, but it has been considerable (27 per mille as compared with an average of 18). In other parts of Germany the effect has been more marked; thus official statistics show that the death-rate has been doubled, or nearly doubled, in several towns. It rose, for instance, to 44 in Posen (average 21), to 45.6 in Frankfort-on-Oder (average 23.2), in Bremen to 34.3 (average 17.1), and in Rostock to 33.5 (average 15.6).

—The citizens of New York, in 1892, propose to celebrate the discovery of America in their own way, assisted by representatives from every State and territory in the Union. A great food show is to be held at Madison Square Garden in October of that year. It is proposed at this exposition to show the progress made by this country in the last four hundred years as regards our food supply. The United States is the greatest food-producing country in the world, and as food is the one thing above all others that first claims the attention of the human family, it is safe to predict that the coming exposition will prove one of the most interesting events of the century. Only food products will be allowed on exhibition, exhibitors being restricted to manufacturers or producers, no dealer as such being allowed to participate. Every article of food exhibited must bear the bona fide name and address of manufacturers, all fictitious brands being rigidly excluded. Liquors, specifics, and patent medicines will not be allowed. Every manufacturer exhibiting must guarantee that his goods at the exposition are the same as offered for sale to the public. Further information may be obtained of the Food Manufacturers' Association, Hudson and Harrison Street, New York City.

—The United States consul at Bordeaux gives, in a recent report, some interesting information about the wines of the Medoc district. He notes that this district, between the sea on the one hand and the Garonne and Gironde Rivers on the others, is called Medoc (*quasi medio aquæ*), because nearly surrounded by water. It is the northern termination of the extensive tract of sand hills and marsh-land called “Les Landes,” extending from Bayonne north, which changes to a bank of gravel on approaching the left bank of the Garonne, and contains some of the most precious vineyards in the world. The soil is of light pebble, and, indeed, on the spots where some of the best wine is produced it appears a mere heap of quartz mixed with the most sterile quality of earth. The best wine is not produced where the bush is most luxuriant, but on the thinner soils, where it is actually stunted, and where weeds disdain often to grow. Here the vine retains the sun's heat about its roots after sunset, so that its juices are matured as much by night as by day. The accumulation of sand and pebbles of which this soil is composed is apparently the spoils of the Pyrenean rocks, brought down by the torrents tributary to the Garonne and other great rivers, and deposited in former ages on the borders of the sea. At a depth of two or three feet from the surface occurs a bed of indurated conglomerate, which requires to be broken up before the vine will grow.

—*Nature*, Jan. 21, contains some extracts from a valuable report by the French agent at Victoria on the salmon industry in British Columbia. Among the details noted by him is the fact that the best fish are almost always taken on the outflow of the river in the place where the fishermen endeavor to meet the fish on their arrival from the sea. A boat is often filled with several hundred fish in a single drift net of from 400 to 500 metres. It is calculated that on certain days the total of the Fraser fishery amounts to not less than 150,000 salmon, which are passed through all the different phases of preserving, and are ready to be forwarded for the market on the same day. An ingenious apparatus used to take the salmon, chiefly on the Columbia River in