

avoidable. Another misfortune also occurred about this time, adding to the difficulties which already beset the path of the expedition. Of the 150 horses sent out to Thunder Bay to transport the stores, etc., sixty fell sick. And to add to the misfortune no veterinary surgeon had been sent out with the expedition. Immediately on learning that sickness had broken out among the horses, Col. Wolseley wrote to head-quarters for a veterinary surgeon. The authorities at Ottawa responded to the request of the commander by sending up a man who had once been a coachman, but who afterwards proved totally unfit for his duties. A great deal of the sickness amongst the horses is attributed to the fact that the animals sent up were artillery horses, accustomed to a limited quantity of food and light work. When they arrived they were put to heavy work, and still kept on a limited allowance of oats. This, with ill-fitting harness, served to cripple a large number in a short space of time. A telegram from Thunder Bay, dated the 29th of June, states that General Lindsay had arrived at Fort William, and was going up the road on a tour of inspection.

SCIENCE AND ART.

RECENT PROGRESS IN CHEMISTRY.

The past year has witnessed the introduction of a large number of new compounds into daily use, and the consequent increase of our knowledge of the best methods of manufacture, and the properties of bodies about which we could hitherto obtain very little information, even in the most complete works on chemistry. A recent bulletin, published by the extensive chemical manufactory of E. Schering, in Berlin, affords matter not to be found in any books, and hence we propose to condense the information for the benefit of our readers.

The hydrate of bromal, to which the formula of  $C_2Br_2HO$  plus  $2H_2O$  is given, crystallizes in white needles, or by slow crystallization in the same form as blue vitriol, though colorless. It has a similar taste and smell to the hydrate of chloral, and is easily soluble in water and alcohol. Salts of silver ought not to produce a precipitate with these solutions.

The hydrate of bromal has hitherto been confined to scientific investigations, as experiments upon animals have shown that its effects are more anæsthetic than hypnotic. Chloral, originally discovered by Liebig nearly forty years ago, was not fully studied until recently. It is a perfectly colorless liquid, having the same boiling point as water, with a specific gravity of 1.5, and a sharp, biting taste, and undergoes spontaneous decomposition, so that it cannot be kept for any length of time. If one equivalent of water be added to it, it forms a dry crystalline mass known as the hydrate of chloral, and one equivalent of alcohol produces similar crystals of an alcoholate of chloral; the chloral has at present merely a scientific interest.

The alcoholate of chloral yields white, transparent, hygroscopic crystals, closely resembling the hydrate of chloral in taste and smell, but less soluble than the latter in water—a reaction that will enable chemists to detect a mixture of the two compounds. If we heat the alcoholate of chloral in twice its volume of water, it melts without dissolving and immediately crystallizes out under the water on cooling, while the hydrate of chloral at once goes into solution and remains dissolved. Sulphuric acid heated with the alcoholate becomes brown, but with hydrate of chloral remains colorless. Nitric acid of 1.2 specific gravity gives ruddy fumes of nitrous acid when heated with the alcoholate, but no fumes are produced under similar circumstances with the hydrate of chloral. It is of the utmost importance to know these reactions, as the close resemblance between the alcoholate and hydrate may lead to serious mistakes, as the properties are unlike and the alcoholate ultimately acts like alcohol itself. The manufacture of hydrate of chloral has assumed enormous dimensions, especially in England and America, but no establishment is able to make large contracts on account of the difficulties which still arise in its preparation. The workmen are so much affected by the fumes of chlorine and hydrochloric acid that they require to be constantly relieved, and this occasions delay and annoyance. It is difficult for the American manufacturer to compete with the German, owing to the high price of alcohol in this country and the revenue tax imposed upon it. The contradictory properties ascribed to the hydrate of chloral by different experimenters may be accounted for on the ground of the presence of the alcoholate in consequence of defective preparation. It is an agent not to be tampered with, and only to be trusted when coming from perfectly reliable sources. If it should be substantiated that in the hydrate of chloral we have a sure remedy for sea-sickness, as well as for the most obstinate cases of sleeplessness, it will prove one of the most important and beneficent contributions made by chemical science during the present century. In Germany the retail of this article is prohibited without the prescription of a physician.

A number of new and important compounds of carbolic acid have been discovered, which are prescribed in cases of putrid wounds for injections, and generally as disinfectants. Among those may be mentioned the sulpho-carbolate of zinc, which is inodorous, crystalline, and easily soluble in water and alcohol; the sulpho-carbolate of soda, a white crystalline powder; and the sulpho-carbolate of copper, resembling blue vitriol in color. A great objection to the employment of carbolic acid as a disinfectant is the persistent odor it has as usually sold for this purpose. This difficulty seems to be obviated in the case of the compounds mentioned above, and it is to be hoped that they will come into general use. Chloro-æthyliden is a new anæsthetic, the properties of which have only partially been studied, but which promises to be valuable.

The above are a few of the most important of the recent contributions of chemistry to the every-day wants of man.

A few months ago they were utterly unknown, now they afford investment for a large amount of capital, and give employment to many skilled workmen, besides conferring untold blessings upon suffering humanity.—*Scientific American*.

The *Moniteur de la Photographie* makes the following remarks upon the origin of cartes-de-visite:—"M. E. Delessert and Agundo were certainly the originators of this style of portraiture. They were in the habit of sending one another small standing portraits representing themselves in various attitudes and in different costumes. We have still in our possession two of these early impressions; in the one, M. Delessert is

ringing at the bell of a street door under shelter of his umbrella; and in the other, the Count Agundo is represented in *costume de voyage*, carpet-bag in hand, paying a P. P. C. visit. The idea, as one perceives, is very complete. M. Disderi was the first to introduce the cartes commercially."

We have heard so much of late years about the beneficial influence exerted by the presence of ozone in the atmosphere, that even non-scientific readers may like to know how it can be artificially produced. Hitherto electricity, phosphorus, and permanganate of potash have been the recognized sources of production, but Professor Mantegazza has discovered that it is developed by certain odorous flowers in a still greater amount. A writer in *Nature* states that most of the strong-smelling vegetable essences, such as mint, cloves, lavender, lemon, and cherry laurel, develop a very large quantity of ozone when in contact with atmospheric oxygen in light. Flowers destitute of perfume do not develop it, and generally the amount of ozone seems to be in proportion to the strength of the perfume emanated. Professor Mantegazza recommends that in marshy districts and in places infested with noxious exhalations, strong-smelling flowers should be planted around the houses, in order that the ozone emitted from them may exert its powerful oxidizing influence. So pleasant a plan for making a malarious district salubrious only requires to be known to be put in practice.—*Pail Mall Gazette*.

**NEW COMET.**—Mr. J. R. Hind, of the Observatory at Twickenham, writes as follows: "Dr. Winnecke, of Karlsruhe, informs me by letter this morning that in the night of May 29, he discovered a comet resembling 'a pretty bright nebula of about 2½ minutes in diameter.' His observations on that night are not sent in a reduced state, but on the 30th, he observed the comet's place as subjoined: 'At 14 h. 13 min. 34 sec. mean time at Karlsruhe, right ascension, 0 h. 50 min. 9.55 sec.; declination N., 28 deg. 52 min. 18 sec.' The diurnal motion appears to be about 1 min. 10 sec. in right ascension (increasing), and 15 min. in declination towards the south."

Mr. Widemann, who is connected with the works of the New York Oxygen Gas Company, says that the use of oxygen in renewing and increasing the flow of oil in petroleum wells, has been so successful that a regular trade has sprung up in oxygen gas for this purpose. The gas is injected into the wells through tubes, and mingling with the hydrocarbon vapors, form an explosive mixture which, when ignited, completely opens seams which have become clogged, and thus renews the flow.

FALL ASSIZES.

EASTERN CIRCUIT.

The Hon. the Chief-Justice of the Common Pleas.

- 1. Pembroke ..... Wednesday ..... 23th Sept.
- 2. Ottawa ..... Monday ..... 3rd Oct.
- 3. L'Original ..... Monday ..... 10th "
- 4. Cornwall ..... Thursday ..... 12th "
- 5. Brockville ..... Tuesday ..... 18th "
- 6. Perth ..... Monday ..... 28th "
- 7. Kingston ..... Thursday ..... 3rd Nov.

MIDLAND CIRCUIT.

The Hon. Mr. Justice Galt.

- 1. Napanee ..... Tuesday ..... 27th Sept.
- 2. Picton ..... Tuesday ..... 4th Oct.
- 3. Belleville ..... Friday ..... 7th "
- 4. Whitby ..... Tuesday ..... 25th "
- 5. Peterborough ..... Tuesday ..... 1st Nov.
- 6. Cobourg ..... Tuesday ..... 8th "

NIAGARA DISTRICT.

The Hon. Mr. Justice Gwynne.

- 1. Owen Sound ..... Tuesday ..... 12th Sept.
- 2. St. Catharines ..... Monday ..... 19th "
- 3. Welland ..... Monday ..... 26th "
- 4. Barrie ..... Monday ..... 13th Oct.
- 5. Milton ..... Wednesday ..... 26th "
- 6. Hamilton ..... Monday ..... 31st "

OXFORD CIRCUIT.

The Hon. Mr. Justice Morrison.

- 1. Cayuga ..... Wednesday ..... 28th Sept.
- 2. Simcoe ..... Monday ..... 3rd Oct.
- 3. Berlin ..... Wednesday ..... 12th "
- 4. Stratford ..... Monday ..... 17th "
- 5. Woodstock ..... Monday ..... 24th "
- 6. Guelph ..... Monday ..... 31st "
- 7. Brantford ..... Monday ..... 7th Nov.

WESTERN CIRCUIT.

The Hon. Mr. Justice Wilson.

- 1. Walkerton ..... Wednesday ..... 31st Sept.
- 2. Goderich ..... Monday ..... 26th "
- 3. Sarnia ..... Tuesday ..... 4th Oct.
- 4. St. Thomas ..... Wednesday ..... 12th "
- 5. London ..... Monday ..... 17th "
- 6. Chatham ..... Monday ..... 31st "
- 7. Sandwich ..... Monday ..... 7th Nov.

HOME CIRCUIT.

Hon. the Chief-Justice of Ontario.

- 1. Brampton ..... Tuesday ..... 27th Sept.
- 2. City of Toronto ..... Tuesday ..... 11th Oct.

**A NEW FIELD FOR EDUCATION.**—*Judy* makes merry over the benevolent aspect of the future as regards animals in confinement. A certain Mr. Salvin suggests in *Land and Water* that they need toys wherewith to amuse themselves. He had a tame otter which found so much benefit from playing with a wooden ball that he thought other animals might be benefited by a similar play-thing. So he communicated the idea to the keeper of the Zoological Gardens, and through him presented large wooden balls to the elephants and rhinoceroses. With these, he says, the beasts were highly pleased. The polar bear has also been presented with a wooden ball, which amuses him immensely. "Where is this to end?" *Judy* exclaims, with a vision of lions and tigers playing rackets, monkeys sitting down to short whist and unlimited loo, instead of spending their time catching fleas; camels and dromedaries playing marbles or flying kites; giraffes at leap-frog, and eagles and pelicans at hop-scotch; while that interesting animal, the bon-constrictor, amuses himself and his fellow creatures with a magic lantern! What a field for Darwin to celebrate!

SURFACE GEOLOGY OF THE BASIN OF THE GREAT LAKES.

Prof. J. S. Newberry has an article on this subject in the *American Naturalist* for June. He says:—

1st.—That in a period probably synchronous with the glacial epoch of Europe,—at least corresponding to it in the sequence of events,—the northern half of the continent of North America had a climate comparable with that of Greenland; so cold, that wherever there was a copious precipitation of moisture from oceanic evaporation, that moisture was congealed and formed glaciers which flowed by various routes towards the sea.

2nd.—That the courses of the ancient glaciers corresponded in a general way with the present channels of drainage. The direction of the glacial furrows proves that one of these ice rivers flowed from Lake Huron, along a channel now filled with drift and known to be at least one hundred and fifty feet deep, into Lake Erie, which was then not a lake, but an excavated valley into which the streams of Northern Ohio flowed, one hundred feet or more below the present lake level. Following the line of the major axis of Lake Erie to near its eastern extremity, here turning northeast, this glacier passed through some channel on the Canadian side, now filled up, into Lake Ontario, and thence found its way to the sea either by the St. Lawrence or by the Mohawk and Hudson. Another glacier occupied the bed of Lake Michigan, having an outlet southward through a channel—now concealed by the heavy beds of drift which occupy the surface about the south end of the lake—passing near Bloomington, Illinois, and by some route yet unknown reaching the trough of the Mississippi, which was then much deeper than at present.

3rd.—At this period the continent must have been several hundred feet higher than now, as is proved by the deeply excavated channels of the Columbia, Golden Gate, Mississippi, Hudson, etc., which could never have been cut by the streams that now occupy them, unless flowing with greater rapidity and at a lower level than they now do.

THE AVERAGE OF HUMAN LIFE.

The man that dies youngest, as might be expected, perhaps is the railway brakeman. His average age is only 27. Yet this must be taken with some allowance, from the fact that hardly any but young and active men are employed in this capacity. At the same age dies the factory workman, through the combined influence of confined air, sedentary posture, scant wages, and unremitting toil. Then comes the railway baggage man, who is smashed on an average at 30. Milliners and dressmakers live but very little longer. The average age of the one is 32 and the other 33. The engineer, the fireman, the conductor, the powder maker, the well digger, and the factory operative, all of whom are exposed to sudden and violent deaths, die on an average under the age of 35. The cutter, the dyer, the leather dresser, the apothecary, the confectioner, the cigar maker, the printer, the silversmith, the painter, the shoe cutter, the engraver and the machinist, all of whom lead confined lives, in an unwholesome atmosphere, do not reach the average age of 40. The musician blows all his breath out of his body at 40. Then come trades that are active or in a pure air; the baker lives to an average age of 43, the butcher to 49, the brickmaker to 47, the carpenter to 49, the furnace man to 42, the mason to 48, the stonecutter to 42, the tanner to 48, the tinsmith to 41, the weaver to 44, the drover to 40, the cook to 45, the inn-keeper to 46, the laborer to 44, the domestic servant (female) to 43, the tailor to 43, the tailor to 41. Why should the barber live till 50, if not to show the virtue there is in personal neatness, and soap and water? Those who average half a century among mechanics are those who keep their lungs and muscles in health and moderate exercise and are not troubled with weighty cares. The blacksmith hammers till 51, the cooper till 52, and the wheelwright till 50. The miller lives to be whitened with the age of 61. The ropemaker lengthens the thread of his life to 55; merchants, wholesale and retail, to 62. Professional men live longer than is generally supposed. Litigation kills clients sometimes, but seldom lawyers, for they average 55. Physicians prove their usefulness by prolonging their own lives to the same period. The sailor averages 43, the caulker 64, the sailmaker 52, the stevedore 55, the ferryman 65, and the pilot 64. A dispensation of Providence that "Maine Law" men may consider incomprehensible is that brewers and distillers live to the ripe old age of 64. Last and longest lived come paupers 67, and "gentlemen" 68. The only two classes that do nothing for themselves and live on their neighbours, outlast all the rest.

**IDEAL FEET.**—The celebrated anatomist, Professor Hyrtl, of Vienna University, recently opened one of his lectures to his class with the singular question: "Which is the most beautiful foot, considered from the anatomical standpoint?" and then said: "It is remarkable that there can be so many divergent opinions on this subject. While the sons of men look upon a small, slender and graceful foot (a lady's foot) as an ideal one, the anatomist utterly rejects it as beautiful, and only the large, long and broad foot is the ideal one in his eyes. Even the greatest classical writers of antiquity, Horace, Catullus, and others, who had great appreciation of feminine beauty, never mentioned in the descriptions of their beloved—and, as is well known, they had many—their small feet. The people belonging to the Celtic race have small feet; the Hindoos especially have such small feet and hands that they may be envied by many European courtesses. The native troops of the English army in India possess in England their own armory, where peculiar kinds of weapons are constructed for them. The sword hilts made for them are much too small for us to grasp with ease. The greatest beauties of Europe, the Italians, have really long and broad feet."

Illinois has a preacher who gets his congregation to church, locks the door, and preaches to them until the deacons collect a certain amount. He preached three hours last Sunday before they came down with \$100 he had levied on them.

Anna Dickinson in a recent lecture demanded, "Why was I born?" There was an emphatic pause. The audience began questioning with themselves why Anna was born. Some thought to torment mankind, and thus learn men patience—others, to show how little wisdom it took to make a successful lecturer—but before many minutes, Anna repeated the question. Then a small boy in the gallery, representing the general sentiment, shrilly piped out, "I give it up."