

SCIENTIFIC.

escaped with his life. His wife's remains were found a week after, but his horse had been carried off, and with it, they supposed, the child. It was through the palanquin-bearers, and a native woman-servant, the whole was made known. They had fled into the woods, from which they did not emerge until a whole day had passed. I have never seen Major Matheson; but he is alive, and will assuredly be rejoiced to hear that his daughter lives. The good Brinzaries may count upon their finding a generous benefactor in one who owes to them the life of his child."

"Maharaj," cried the *gosain*, "there was a little *kitab* (book) found in the palanquin, and it was the only thing the accursed thieves and murderers left behind."

"Can I see it?" asked I.

It was a handsome, old, much-read copy of Shakespeare; and in the fly-leaf was written:

"Grace Matheson, from her Husband."

It was enough. And as I read the name, the worthy *gosain* held up his hands in admiration. He told me the Brinzaries were quite willing to journey to Poonah, if needful; or to remain at Jejurry until such time as I could communicate with Major Matheson. But whilst I was reflecting on the course to be pursued, that which we call fate was anticipating my movements, and about to render useless my interference in the matter.

There are incidents in some lives which follow up each other with such celerity, when least expected, that it is only the utterly thoughtless who can treat them with indifference and disregard. That Providence which foresees all, knows best when the hidden things that perplex us are to be set clearly before us, without doubt and without difficulty.

It was evening, and I was once more with the Brinzaries, the *gosain*, and my little friend Motee, when Jung Rao, running at the top of his speed, announced the arrival, at my tent, of a *sahib* from Poonah.

"Indeed," said I; "who can it be?"

"His salam to you, sir; and he begs you will come and see him. He has sprained his ankle by a fall from his horse; and his *syce* (groom) and baggage have not yet come up."

The Brinzaries are celebrated for their expertness in setting to right all sprains, salving all wounds, and knowledge of all drugs; and I had but to mention the accident to receive the proffered aid of Mahi. She hastened to bring from her boards wherewithal to compound a lotion, or poultice, or both, for the injured limb, and was almost as soon beside the sufferer as myself.

I knew him at once—I knew him well. It was Cosmo Gordon, a young ensign in a native infantry regiment. He was not only a very handsome youth, but was quite the gem of our *corps dramatique*; and, if truth must be told, had played "Emily Worthington" to my "Lucretia Mactab" not a month before.

The sprain was not a very severe one, and Mahi's care and treatment soon gave him relief. It was to amuse him, as he lay on my couch, whilst his own tent was being pitched, that I told him the strange story of the Brinzaries, and shewed him the book whose hapless owner had been so cruelly murdered.

"Good Heavens!" exclaimed he, reading the name—"Grace Matheson! Do you not know, Innes, that she was my aunt?"

Indeed, I did not know. But I will tell the reader what I know. Matheson, now General, was rendered truly happy by the discovery of his daughter, nor had the worthy Brinzaries reason to repent having protected the infancy of one who, in their declining years, became their tender protectress. Motee, otherwise Grace Matheson, is now a happy wife and mother. Her husband, some years her senior, no longer personifies young ladies on any stage; but if the reader visits Subatchekhuburabad, in Mysore, he will find in Colonel Cosmo Gordon a kind host and an honest man, beloved by all who know him.

VIEW ON RICE LAKE.

This lake, on which the accompanying sketch was taken, is situated on the eastern boundary of the country of Peterborough. It is some 22 miles in length, and has an average breadth of four miles. The character of the scenery is remarkable for its soft and tender beauty—a character which prevails throughout its whole extent. At the eastern end the Lake narrows. Just opposite this point stands the residence of Francis Birdsall, Esq. The gentle eminence on which it rises, and from whose verandah the writer's sketch was taken, commands the whole Lake prospect westward; the richly-wooded shores immediately below mark the spot where the Trent issues from the bosom of its parent waters. In the summer season the steamer "Otonabee" performs its river and lake trip between Hastings and Harwood; principally a business vessel, but often chartered by pleasure-seekers, and the votaries of Pic-nic and Terpsichore. To the artist the region is instinct with beauty, and often pervaded with a charm of light and shade, and a splendour and wealth of colour which fascinate the eye.

CHURCH OF ENGLAND CATHEDRAL,
St. Johns, Nfld.

This edifice, one of the finest in St. Johns, was erected at a cost of about thirty thousand pounds. It is built in the early English style after plans by Gilbert Scott. St. Johns contains two other Episcopal Churches besides the Cathedral. The island of Newfoundland constitutes a Bishopric, having been erected in the year 1839, when the Right Rev. A. G. Spencer was appointed Lord Bishop by letters patent from the Crown. In 1844 the present Bishop of Newfoundland, the Right Rev. Edward Fields, was appointed to succeed Bishop Spencer, also by the Crown, but as a matter of course the Church of England in Newfoundland is now placed on the same footing as in the other British American Colonies, and when a vacancy recurs it must be filled up through election by the Diocesan Synod, for which provision has already been made.

A church member at Galesburg, Ill., had his pew rent raised to \$25 a year, and arose and spoke in meeting—said he: "Great Caesar, here's a nice state of affairs, here's the gospel going up and pork going down! What's to become of us?" The minister advises him to "go West" with the hogs.

THE NATURE OF DIFFERENT GUMS.—Dr. Sacc, of Neuenburg, Switzerland, has made an extensive inquiry into the nature of different resins. We condense from it the following results. The resins spoken of are copal, amber, dammar, common resin, shellac, elemi, sandarach, mastic, and Caramba wax. All these resins can be reduced to powder.

The following will become pasty before melting: amber, shellac, elemi, sandarach, and mastic; the others will become liquid at once.

In boiling water, Caramba wax will melt; common rosin will form a semifluid mass; dammar, shellac, elemi, and mastic will become sticky; while copal, amber, and sandarach will remain unchanged.

Dammar and amber do not dissolve in alcohol; copal becomes pasty; elemi and Caramba wax dissolve with difficulty; while rosin, shellac, sandarach, and mastic dissolve easily.

Acetic acid makes common resin swell; on all the others it has no effect.

Caustic soda dissolves shellac readily, rosin partly; but has no influence on the others.

Amber and shellac do not dissolve in sulphate of carbon; copal becomes soft and expands; elemi, sandarach, mastic and Caramba wax dissolve slowly; while rosin and dammar dissolve easily.

Oil of turpentine dissolves neither amber nor shellac, but swells copal; dissolves dammar, rosin, elemi, sandarach, and Caramba wax easily, and mastic very easily.

Boiling linseed oil has no effect on copal, amber, and Caramba wax; shellac, elemi, and sandarach dissolve in it slowly, while dammar, resin, and mastic dissolve easily.

Benzine does not dissolve copal, amber, and shellac, but does elemi and sandarach to a limited extent, and Caramba wax more easily; while dammar, resin, and mastic offer no difficulty.

Petroleum ether has no effect on copal, amber, and shellac; it is a poor solvent for resin, elemi, sandarach, and Caramba wax, and a good one for dammar and mastic.

Concentrated sulphuric acid is indifferent to Caramba wax; it dissolves all resins, imparting to them a dark brown colour, excepting dammar, which takes a brilliant red tint.

Nitric acid imparts to Caramba wax a straw colour; to elemi, a dirty yellow; to mastic and sandarach, a light brown; it does not affect the others.

Ammonia is indifferent to amber, dammar, shellac, elemi, and Caramba wax; copal, sandarach, and mastic become soft, and finally dissolve; while rosin will dissolve at once.

It is not difficult by means of these reactions to test the different resins for their purity.—*Deuzlin, Polytech Journal.*

ENAMELLED WRITING SURFACES.—A useful substance for making glass labels, sign boards, etc., is made as follows: 30 parts, by weight, of pure saltpetre, 90 parts of fine sand (silicic acid), and 250 parts of litharge, to be thoroughly blended, and then melted. The enamel made by these means can be written or drawn on with the same facility as the best paper; and has the novel, and, we may say, the unprecedented, capability, of perfect permanency, if the ink be properly prepared, as the writing can be burnt in, by means of a muffle, in less than a minute. Another advantage will help to recommend it to ingenious inventors: it can be treated, for photographic purposes, with a substitute for collodion. This substitute can be prepared as follows: 10 parts of gum, 1 part of honey, and 3 parts of bichromate of potash; filtered and dried on the surface of the above-described preparation. The plate is exposed in the usual way. The development is made by dusting, the powder being composed of 10 parts, by weight, of cobalt oxide, 90 parts of iron scales, 100 parts of red lead, and 30 parts of sand. When these components are mixed, the chromate should be decomposed by immersion in a bath of water, acidulated with 5 per cent of muriatic acid. After washing and drying, the enamel should be melted on a piece of iron plate, coated with chalk; a minute's subjection to heat is enough, and the photograph on the enamel, perfectly glazed on, will be apparent.

SOLID BEER.—This is eminently an age of condensation, and to put as much possible into the smallest space appears to be the chief aim of science. Liebig's extract of beef reduces a bullock, so far as its food properties are concerned, to the compass of a pint jar, and the lacteal produce of a whole herd, by the condensed milk process, may be contained in a quart pot. Truly, the age produces some queer paradoxes, and none more so than in the results of manufacturing science. In former days, says the *Food Journal*, it was the custom to buy bread and even beef by the yard; but we believe that it is only in the present day that we can get our beer by the pound. By a very simple process, introduced by Mr. Mertens, the wort, after being made in the mash-tub of malt and hops in the usual manner, is sucked up by a pipe into a large vacuum, (exhausted by an air-pump,) and then persistently worked round and round, while the moisture is evaporated. The wort emerges from its tribulations with a pasty consistence, and is allowed to fall from a considerable height into air-tight boxes, in which it reposes like hard-bake. It soon gets so exceedingly tough that it has to be broken up with a chisel and mallet, and in that condition is easily sent abroad, or to any part of the world, for people to brew their own malt liquor. We have had the wort subjected to analysis, the results of which, in one hundred parts, show that there is almost absolute purity: Gum, 64.219; sugar, 20.664; lupulin, (the active principle of hops,) 2.000; albuminous matter, 0.600; mineral matter, 1.500; moisture, 11.017.—*American Brewer's Gazette.*

THE COMPASS PLANT.—The first mention of the so-called "polarity" of the compass plant, *Silphium laciniatum*, was made in communications addressed to the National Institute, by General Benjamin Alvord, then Brevet Major, U. S. A., in 1842; although the fact was well known to many hunters and others.

General Alvord's first conjecture, that the leaves might have taken up so much iron as to become magnetic, having been negatived by analysis, he suggested that the resinous matter, of which the plant was full, and from which it was sometimes called resin weed, might have some agency in producing electrical currents.

As to its geographical distribution, he stated that it extended from Texas on the south, to Iowa on the north, and from Southern Michigan on the east, to three or four hundred

miles west of Missouri and Arkansas; its chief habitat being rich prairie land.

Dr. Gray thought "that the hypothesis of electrical currents was hardly probable, as resin was a non-conductor of electricity; but that the polarity was due to the fact that the leaves were inclined to be vertical, and the direction of their edges north and south was the one in which their faces would obtain an equal amount of sunlight."

Mr. Charles E. Bessey, of the Iowa State Agricultural School, says:—"We have the curious 'compass plant,' *S. laciniatum*, growing in great abundance throughout all this region. The polarity of its leaves is very marked. Use is made of it by the settlers, when lost on the prairies in dark nights. By feeling the direction of the leaves, they easily get their bearing."

From the record of these observers, there can be little doubt that the leaves on the prairies do assume a meridional bearing; and the cause assigned for this by Dr. Gray is undoubtedly the correct one, viz.: that both sides of the leaf are equally sensitive. It is well known that the two sides of a leaf usually differ in structure, that the number of stomata, or breathing holes, is much greater on the under than the upper surface; and that the tissue of the upper is denser than that of the lower stratum. As the two surfaces of the leaf of *S. laciniatum* appeared something alike, Dr. Gray suggested that it would be well to examine the leaf microscopically, in order to see if it corresponded with ordinary leaves in the above respects, or with truly vertical leaves, the two surfaces of which are usually similar, or nearly so. Such an examination was accordingly made, when it appeared that both surfaces of the leaves presented the same number of stomata; while the leaves of other species of *Silphium*, in which no tendency to assume a north and south position is shown, exhibited great difference in the stomata of their surfaces. The magnifying power used was about four hundred diameters.

The observations here recorded appear to show that the meridional position of the edges of the leaf is to be explained by the structure of the two surfaces, which, being identical, at least in the important respect of the number of the stomata, seek an equal exposure to the light; the mean position of equal exposure, in northern latitudes, being that in which the edges are presented north and south, the latter to the maximum, the former to the minimum of illumination.—*W. F. Whitney, in American Naturalist.*

BILLIARD BALLS FROM GUN COTTON.—Professor Charles Seely relates a curious experiment. Gun cotton, such as is prepared for making collodion for photographers, is not soluble in alcohol, but if a little camphor is added it dissolves at once. An artificial ivory may be prepared by triturating gun-cotton with solid camphor, which, being subjected to a hydraulic pressure, and then coated with a compound of gun-cotton and castor oil, may be formed into billiard balls, which are pronounced by experts to be superior to the natural ivory.

WARMING COUNTRY HOUSES.

One of the most important items in the preservation of the general health is being comfortably warm all the time, for then we would never take cold. There should be a room in every farmer's family which should be kept at a temperature of not under 65° Fah., from daylight until bed-time, all winter, by stove or furnace heat; stoves are better, because they will bring up the heat more quickly. When the farmer comes in from his work, he is generally over-heated and tired, both conditions making him greatly more susceptible of taking cold; or, on the other hand, he is very cold from having been riding, or engaged in something which has not involved activity enough to keep him adequately warm, and then a well-heated room is exceedingly grateful, and gradually raises the temperature of the surface of the body to its natural condition.

Large stoves consume less fuel in proportion than small ones, and give out more heat, hence are more economical.

It is a common error in the country to have too small stoves, so as to economize space, and under the mistaken notion that they consume less fuel in proportion. A circular stove, six feet high and about two feet in diameter, lined with fire brick two feet high, will keep a large room more equably warm, and maintain a purer atmosphere, with a very much less amount of fuel, than our common stoves. Stoves of this shape, made of porcelain, are used in Germany and Russia, where wood is grown for fuel; and, from personal observation, we think that about half the amount of wood is consumed, giving a greater, better, and more comfortable heat than we have here. In farmers' houses, an immense amount of heat is used in warming "all out doors." The longer a flue is, the stronger the draft; all flues should be built from the ground, thus securing a good draft, and also saving millions of property every year from being burned, which is the case when flues are built on floors up through the rafters and roof.

Two sitting-rooms on the same floor, and one or two chambers above, may be adequately warmed by one stove thus: Let the stove stand in one room, and let a pipe of good size be sent through the partition into the adjoining room, where it should expand into a large drum; from this drum the ordinary pipe should extend, through the floor, into the chamber above, with a drum there if needed. Only a moderate amount of heat is needed in a chamber; but that moderate amount is needed in winter time. There is no advantage in going to bed in a cold room, nor in sleeping in a cold room, nor in getting up and dressing in a cold room; persons may survive it; many have lost health by it. To have the chill taken off the air on going to bed, and when dressing, is comfortable and healthful. A room under 45° is a cold room for a sleeping apartment, and sleeping in an atmosphere, indoors, lower than that is always hurtful, is always positively pernicious, for the simple reason that such a temperature causes the carbonic acid gas of a sleeping apartment to condense and settle in the lower part of the room, where it is breathed into the lungs, with the most pernicious results. Sleeping in a room cooler than above named is especially dangerous to aged, feeble, and invalid persons, as it tends to cause inflammation of the lungs. Persons may sleep out of doors with impunity when the temperature is many degrees lower; that is because the out-door air is pure, is full of life, full of oxygen, without any admixture of indoor poisons, and hence gives a vigour of circulation, which keeps the whole body warmed to its natural point, resisting cold and all diseased conditions.—*Hall's Journal of Health.*