PROCEEDINGS

OF THE

Nova Scotian Institute of Science

SESSION OF 1911-12

ANNUAL BUSINESS MEETING.

Electrical Engineering Lecture Room, Technical College, Halifax; 13th November, 1911.

THE PRESIDENT, WATSON L. BISHOP, in the chair.

Other members present: PROF. E. MACKAY, M. BOWMAN, F. W. W. DOANE, P. R. COLPITT, W. MCKERRON, PROF. C. L. MOORE, DR. H. JERMAIN CREIGHTON, PROF. D. S. MACKINTOSH, PROF. C. D. HOWE, H. S. DAVIS, and H. PIERS.

PRESIDENTIAL ADDRESS: (1) Review of the Institute's Work, (2) Death of Dr. R. W. Ells.—By WATSON L. BISHOP.

Gentlemen,—As we are entering upon another year it gives me the opportunity to call your attention to the work of the year which is gone, in order to stimuate further improvement.

We have at last, as an Institute, found an ideal home in the Technical College—the provincial centre of Science *applied*. We have not only comfortable but aesthetic rooms for meeting—large or small to suit the size of the audience. We have at hand facilities for illustrating papers, popular or scientific, to which for nearly half a century the Institute has been a total stranger. We have a large staff of scientific professors at home in the same building and an increased staff of scientific men at Dalhousie University. But all this wealth of facilities failed during the past

Dalhousie. But all this wealth of facilities failed during the past year to produce the output of the old strenuous days when we met in the poorly lighted, badly seated, and primitively warmed and ventilated museum on Cheapside.

It is true, the Institute of 1863 has lost heavily by emigration. The medical doctors formed an association of their own. Those developing mining industries branched out into the Mining Society, of Nova Scotia; and later the engineers swarmed out to form their own hive. But while making allowance for all this, there should surely be better conditions for the development of the scientific cult to-day than ever before. It is therefore with some disappointment I refer to the work of last year. It has not come up to our improved opportunities. Our men of science have been too completely engrossed in the increasingly exacting duties of their various routine public services. We must not forget, however, to keep the vestal fire of scientific research alive in this focus of the community. That is a duty incumbent on everyone engaged in scientific labor, and on every one seeing hope in the scientific cult.

We had three meetings during the past year. The retiring President in the Annual address gave an able sketch of late progress in the production of organic compounds, and made suggestions for our future work which we have not yet attempted to energetically develop.

At our February meeting Mr. Walter H. Prest advocated a preliminary survey of Nova Scotian caves for possible natural history or anthropological remains. Your Council supplied him with some aid for such exploration, an account of the results of which will be presented by Mr. Prest himself at this meeting.

The May meeting brought out some valuable meteorological notes by Mr. F. W. W. Doane, C. E.; a comparison of the monthly mean temperaturs of Halifax and Plymouth on opposite sides of the Atlantic by our ex-President, Dr. Henry S. Poole, F. R. S. C., who does not forget the Institute, although absent from the Province; a sketch of Mineral Occurrences in the Granites at New Ross, Lunenburg County by Mr. A. L. McCallum, B. Sc.; a paper on the effect of gravity on the cencentration of solutions, by Mr.

Harold S. Davis, B. A.; and notes on fishes in Nova Scotia by our Secretary Mr. Harry Piers.

This is good work so far as a few members of the Institute are concerned. But more of us should have put new work on its records. Our publication funds and our magnificent exchange list, put us within the reach of privileges and advantages which I trust we may fully exploit during the present year.

Perhaps we should annually attempt at least one or two popular demonstrations of science applied to industries, the conservation of health, or the development of public utilities—something to interest the general public or to inspire the young student.

Death of Dr. R. W. Ells.

We have to record with profound regret the loss during the year of one of our most useful and eminent members. By the passing away of the late Dr. Robert Wheelock Ells, LL. D., F. R. S. C., who died at the late residence on O'Connor street, Ottawa, early Tuesday morning, 23rd May, Canada loses one of her ablest scientists. Dr. Ells had been a member of the Geological Survey of Canada for nearly forty years, having joined the staff under Sir Wm. Logan, the founder of the survey.

The late Dr. Ells was descended from U. E. L. ancestors who came to Nova Scotia in 1761. He was born at Cornwallis, N. S., in 1845 and was educated at Horton Academy, at Acadia University and at McGill University from which he graduated in 1872 with first class honors and the Logan gold medal in geology, and natural history. He married in 1873, Miss Harriett N. Stevens of Onslow, N. S. Joining the staff of the Canadian Geological Survey in 1872, he has since been constantly engaged in geological work in that branch of the service.

He was also a prominent Fellow of the Royal Society of Canada, a Fellow of the American Geological Society, and a member of the Canadian Mining Institute. Besides being a past president of the Ottawa Literary and Scientific Society, Dr. Ells had also been president of the Ottawa Valley Graduates' Society of McGill University, and for a number of years past had held the position of representative Fellow for the province of Ontario

on the Corporation of McGill University. He had published numerous reports on the geology and mineral resources of the provinces of Nova Scotia, Prince Edward Island, New Brunswick and Quebec, as well as of the Northwest Territories and British Columbia. In addition he had written various papers for the Royal Society of Canada, the Geological Society of America, the American Institute of Mining Engineers, the Ottawa Field Naturalists Club, the Canadian Mining Institute and the Nova Scotia Mining Institute.

Dr. Ells was perhaps best known in recent years for his work in connection with the problem of the utilization of the oil shales of Eastern Canada. It was indeed largely through his efforts that attention was first called to the great value of these deposits and his memoir published in 1910 is the standard work on this subject.

From the year 1894 he has contributed many valuable geological papers to our Institute, which will be found in its Transactions.

Our duty is to endeavor to fill up our ranks with new men who will carry on, down the current of time, the good work which makes the past history of our Institute one of the most illustrious in Canada.

The Treasurer, MR. BOWMAN, presented his annual report, showing that the receipts for the year 1910-11 were $781.74, the expenditure $540.83, and the balance in current account on 1st November, 1911, was $240.91; while the reserve fund was $696.38, and the permanent endowment fund was $885.58. The report having been audited, was received and adopted.

The Librarian's report was presented by H. PIERS, showing that 1,810 books and pamphlets had been received by the Institute through its exchange-list during the year 1910; and 1,357 have been received during the first ten months of the present year (1911), viz. January to October, inclusive. The total number of books and pamphlets received by the Provincial Science Library (with which those of the Institute are incorporated) during the year 1910, was 3,421. The total number in the Science Library on 31st December, 1910, was 42,409. Of these, 32,397 belong to the Institute, and 10,012 to the Science Library proper. That is,

about 76 per cent. are the property of the former, and about 24 per cent. belong to the latter. 626 books were borrowed besides those consulted in the library. No binding or purchasing was done during the year, there being no grant available for the purpose. The report was received and adopted.

The following were elected officers for the ensuing year (1911-12):

President,—WATSON L. BISHOP, *ex officio,* F. R. M. S.

1st Vice-President,—ALEXANDER HOWARD MACKAY, L.. D., F. R. S. C.

2nd Vice-President,—DONALD M. FERGUSON.

Treasurer,—MAYNARD BOWMAN, B. A.

Corresponding Secretary,—PROF. EBENEZER MACKAY, PH. D.

Recording Secretary and Librarian,—HARRY PIERS.

Councillors without office,—PHILIP A. FREEMAN; PROFESSOR FREDERIC H. SEXTON, B. SC.; FRANCIS W. W. DOANE, C. E.; A. L. MCCALLUM, B. SC.; PARKER R. COLPITT; H. JERMAIN MAUDE CREIGHTON, M. A., M. SC., DR. SC., F. C. S.; and PROFESSOR CLARENCE L. MOORE, M. A.

Auditors,—DONALD S. MACINTOSH, M. SC., and ALEXANDER MCKAY, M. A.

The celebration of the fiftieth anniversary of the foundation of the Institute was discussed and referred to the council to take such action as it might think fit.

PROFESSOR MOORE suggested that some method be devised for cooperation work in obtaining data on biological questions in the province. The matter was referred to the council.

FIRST ORDINARY MEETING.

N. S. Technical College, Halifax; 13th November, 1911.

THE PRESIDENT, WATSON L. BISHOP, in the chair.

The ordinary meeting was held on the conclusion of the annual business meeting.

In the absence of the author, MR. PIERS read a "Report on Cave Exploration in Hants County, Nova Scotia," by WALTER HENRY

PREST, of Bedford, N. S., being the result of investigations undertaken by MR. PREST at the request of the council of the Institute. (See Transactions, p. 87). The subject was discussed by PROF. C. L. MOORE, PROF. E. A. HOLBROOKE, PROF. D. S. MACINTOSH, H. PIERS, and others.

SECOND ORDINARY MEETING.

N. S. Technical College, Halifax; 11th December, 1911.

THE FIRST VICE-PRESIDENT, DR. A. H. MACKAY, in the chair.

It was announced that PROFESSOR C. J. CONNOLLY, PH. D., department of biology, University of St. Francis Xavier, Antigonish, N. S., had been duly elected an associate member by the council on 5th November.

MR. PIERS drew attention to the desirability of collecting information regarding the economic and medicinal use of Nova Scotia plants among our Micmic Indians.

In the absence of the author the following paper was read by PROF. C. L. MOORE:—

SACRED PLANTS OF INDIA.—BY CAPTAIN J. H. BARBOUR, R. A. M. C., F. L. S., Nowgong, Central India.

In view of the supreme interest which will centre round India during this present year and culminating in December when His Majesty, the King, will visit the country to hold the great Delhi Durbar, there is certain to be a desire on the part of the many people who will visit the country, some for the first time, to learn before they come, as much about India, her history, customs and manners as they can in order to appreciate the magnificence and significance of this important event in her national life and also to create for themselves an interest in what they may see generally over the country.

There will be much travelling up and down the vast peninsula, and guide books, histories and other literature will be greatly in evidence to elucidate and explain points. There is, however, one subject which may appear insignificant compared with the others and yet it is one which will be very much to the fore wherever the traveller goes, I mean the plants of the country. He will see new

and strange varieties of plants from the time he lands in Bombay till the time he leaves India again, and he will see many which are sacred and associated with Indian religious thought to a very large degree, and hence I have endeavoured to try and write this article in the hopes that it may be a help and pleasure to many who may care to look upon them during their stay in the country, which in many cases will only be for a few weeks or so.

I often wonder how many think about the trees and plants they see when either on their railway journey or when visiting the shrines and temples of ancient India, about which are usually planted trees or plants of a certain kind; and yet the lives of the Hindus are intimtely woven both now and in the past with some of these plants; and the plants themselves, could they but speak, could tell wonderful tales of yore, when the Pantheon of Hindu deities was perhaps more in evidence than it is to-day. Yet to-day it is not by any means obliterated. The old is still with us in India and the native has remained unchanged, except perhaps in the large cities for centuries. Civilization and Western influences have, it is true, prevaded the large centres of the community; but away in the jungle villages, the villager still preserves his reverence for his ancestors' deities and his hopes in the sacredness of his faith and the associations which surround it, and amongst these the trees which form the subject of my article. For these reasons I have thought that it may prove interesting to your readers to tell them something about these plants, what they are like, their uses either economically or medicinally, and their associations, so far as can be found out at the present day. The writer has practically seen all the trees or plants to which he refers and so can speak from experience, both as to their uses and also their interesting points to a great extent. The object of this article being, however, not only to prove interesting, but useful to all who may be thinking of visiting India and wishing to know the native names of the trees, the names of the trees will be given, not only in the Latin form, but in the vernacular and English in each case.

Before proceeding to speak about these plants a word or two must be said on one or two of the chief deities to which these

plants are sacred, and the remainder will be grouped together and referred to as the plants are spoken of.

Let us take Vishnu first as he is the most popular of all Hindu deities in his various incarnations. He is the personification of nature's preserving powers. When the whole earth was covered with water he lay sleeping on a serpent, and while he slept, a lotus sprang from his navel and from it the great Brahma sprang the Hindu god existant. His heaven is on Mount Meru and his incarnations are ten.

Siva, the second and only other great deity I shall here refer to, represents the destructive power of nature, or perhaps I ought to say its transforming and reproducting power, and hence is of both terrible and pleasing dispositions. He is usually represented as a white man with five heads and a third eye in each head, and the heads are surmounted by a crescent moon, and the river Ganges flows, as it were, from his fifth head. His most usual image is, however, the "Linga" which is the sign of reproduction and which is exceedingly common on many temple steps. His heaven is Mount Kackasa.

These are the two chief deities to which most of these trees are sacred, but there are many more; and to these, trees and plants are also sacred. I shall first of all point out the plants sacred to these two deities and then grouping the others, refer to them together. I shall also say a few words about sacred trees which are sacred, as it were, for themselves alone and yet have no doubt a deeper idea beneath.

The following plants are sacred to Vishnu alone: *Ocymum sanctum.*

To Siva: *Aegle marmelos, Crataeva religiosa, Poinciana regia, Zizyphus jujuba, Jasmimum sambac, Gardenia lucida, Michelia Champaca, Ficus religiosa and Ficus Bengaliensis.*

To Siva and Vishnu together: *Jasmimum sambac, Artemisia vulgaris, Nerium odorum, Ixora coccinea, Origanum Marjoram.*

Ocymum sanctum, Vern. "Kalatulsi." Holy Basil. The only plant dedicated to Vishnu, and a most important one it is, though only an herb, erect, softly hairy, with ovate toothed leaves,

small corolla purple in colour. The fruit is reddish brown. Sometimes the plant is purple all over. It is cultivated very much round temples and in Brahmins' gardens, and is highly reverenced.

"Nothing on earth can equal the virtues of a Tulasi" has been quoted often. Puja (that is invocations) is offered to it daily. When a Brahmin is dying, one of the plants is brought and put on a pedestal and puja is offered to it. A bit of the root is put into the mouth of the dying man, and its leaves are sprinkled over face, eyes, ears and chest. He is also sprinkled with a twig of it, dipped in water, from hand to foot. At the same time his friends say aloud "Tulasi, Tulasi, Tulasi"! and the man dies happy and goes straightway and certainly to Swarga. To obtain pardon for all one's sins, it is enough to look at this sacred plant. By touching it a man is purified of all his defects. Salvation is assured to any one who waters and tends it daily. A branch offered to Vishnu in milk will be more pleasing to the god than a thousand cows. A sprig of it dipped in saffron and offered to the god at any time ensures the person's enjoyment of Vishnu's happiness. To give a twig of it to anyone suffering cares and anxieties, ensures a certain means of securing for him a satisfactory ending to all his difficulties. It is much used in native medicine with a supposed excellent results. Its leaves have a sweet aromatic scent and the Brahmins use the plant as an aid to digestion after meals, and after ablutions to prevent getting chills, as it is supposed to have cordial-like effects.

Aegle marmelos, Vern. "Bel." Ball Fruit. A fairly large tree found every where in India and as common in some parts of the jungle as near villages and temples. Its thorns and its flowers are in panicles. The fruit is about the size of an orange, round and smooth with a pulpy interior; and when dried, the appearance is rather honey-combed. The fruit is a well known remedy for dysentery, and it is used a good deal. It is bitter, however. This tree is sacred to Siva.

Crataeva religiosa, Vern. "Warwan." Is found near many temples in Central India and Bengal. A tree with long petioled leaves and ovate leaflets. Flowers in racemes, white or buff with long purple filaments. Fruit large and round or oval. The leaves

are armomatic and are used in rheumatism, while the roots and bark are used in calculi.

Poinciana regia, Vern. "Sandesra." Gold Mohur tree. The most beautiful tree in India in my opinion, and its various names well become it, for it is indeed a queen of trees in its beautiful and graceful green symmetrical fan-like arrangement of branches and leaves which towards the end of the summer take the place of its golden flowers. The flowers are of old gold or striped with red, and the English name is the name of the only gold coin in India. Covered with flowers two or three inches in size across, the tree is indeed in May and June a veritable flame of gold and no description on paper can equal the gorgeous look of one of these trees in full bloom. Siva is highly honored in this tree.

Zizyphus jujuba, Vern. "Bhor." Jujube tree. Not a very large tree, but a thorny one with small ovate leaves, dark green on the upper surface and downy brown underneath. Flowers in cymes, strong smelling and small; fruit the size and colour of a yellow cherry. It is very common everywhere in the jungles, and it is thought to be, as well as being sacred to Siva, the Siora of the Koran, a tree which Mohammed in his miraculous night journey found growing at the further limit of the seventh heaven. The wood of the tree is poor, but the fruit is eaten raw, although it is bitter. Many a time have I seen the natives collecting them in abundance. It has mild medicinal properties as a blood purifier, but otherwise there is nothing striking about it, and one might easily pass the tree without noticing it.

Jasmimum sambac, Vern. "Mogri." Arabian Jasmine. A shrub with oval leaves and racemes of opposite white flowers. Fruit rather small, round, and black. One would always recognize this as a variety of jasmine, and it is appropriately associated with Siva in his reproductive energy, for the leaves are used as a lactifuge; the bruised leaves being applied to the breasts. It stops the secretion of milk in cases of threatened abscesses and hence women must bless Siva for having associated with him such a remedy.

Gardenia lucida, Vern. "Dekamali." English is Dikamali or Gardenia. A large shrub or small tree with smooth shiny oval

smooth leaves. Flowers white and it is often seen as an ornamental shrub in gardens. A strong smelling yellow gum exudes from its shoots and from this an ointment is made which is called by its Hindu name. This ointment I may add is used for foul ulcers and to keep flies off sores. The flower is rather a pretty one and is a valuable addition to the ornamental shrubs of the country.

Michela champaca, Vern. "Champaka." No English equivalent. A fair sized tree, more or less evergreen with long ovate pointed waved leaves. Flowers a delicate pale yellow and very fragrant. Fruit is a spike of carpels. It is a rather curious looking tree and gives, when the leaves are fully expanded, a good deal of shade. The wood is very soft and easily broken. The flowers are used by the native women as ornaments in their hair and are much offered in their temples to Siva. Shelley speaks of the tree thus:—

"The champak odours fall
Like sweet thoughts in a dream."

The pale yellow flowers have a sweet oppressive odour which is celebrated in Hindu poetry, and from the wood images are made of Buddha for temple uses.

Ficus religiosa, Vern. "Pipal." The Peepul tree or sacred fig. A large, smooth handsome tree, spreading somewhat, with leaves long and pointed much. It looks rather like a wide graceful poplar tree. Fruit is size of a black cherry. It is common over India, in the jungle and near temples and places of habitation. It has been known to live for 2000 years. It is found often near where Brahmins perform the ablutions, and the rustle of the leaves in a breeze has been compared to the sounds of a cithara. Under this tree Vishnu is supposed to have been born by some. No one is allowed to cut it down or lop off branches. Leaf-pulling is only allowed for acts of worship. Each tree springing from an unpreceived source is emblematical of the body which really springs from, and is one with the godhead. It is also said to typify the universe. Sometimes this tree is invested like a Brahmin with that great honor the "triple cord" which only Brahmins among the castes of India can aspire to. Sometimes it is solemnly married, as other trees and plants are to each other in India. In

the case of the Peepul tree, a Margosa tree (*Melia Azadirachia*) is usually chosen as its mate, or occasionally a plantain (*Musa*) Here and there one may on roadsides see a Peepul tree and a Margosa tree side by side in little mounds. This union is not accidental, but a true marriage union. They are wedded by actual ceremonies used for Brahmins and after a time it has been seen the branches of the two trees actually intertwine and their trunks are incorporated with each other.

Ficus Bengaliensis, Vern. "Wad." Banyan tree. A fine tree possession aeria roots, smooth bark, light greenish leaves, ovate and downy beneath, smooth and shining when old. Fruit, deep-red in colour, size of a cherry. Common in the plains and jungles and may grow to an immense size as the famous one in the Nerbudda Valley, Central Provinces of which Arnold speaks:—

"Its ample shade
Cloistered with columned drooping and roofed
With vaults of glistering green."

With this tree also marriages are celebrated. A Palmyra palm may be seen apparently growing out of the trunk of a Banyan, but it is really the other way on, the palm being the older, the seeds of the Banyan being dropped in its fronds and throwing its roots to the ground. (Roxburgh).

We now come to the trees sacred to Vishnu and Siva together. I have already described the Jasmine and I pass on to the others.

Artemesia vulgaris, Vern. "Daona." Wormwood. A tall strong herbaceous plant, leaves pinnated or lobbed deeply, toothed and cut. Flowers in panicles, very small and florets yellowish. Bract, leafy or dry. An uninteresting plaint in my opinion from a purely botanical point of view. It is curious, however, to note that in Old Testament history it is associated with distress and calamity and possibly this association may also be seen in its association with the Hindu Siva, in his terrible embodiment. It is worthy of note that absinthe is made from some species of Arthemesia.

Nedium odorum, Vern. "Kanher." Oleander. A plant or shrub rather known in European conservatories and considered to

be very poisonous, even out here. It has beautiful red flowers and long linear lanceolate leaves.

Hooker thinks, "the willow of the brook" in Scripture to be the Oleander; and he states that wood, flowers and leaves are all very poisonous, but I have heard of its being used out in India, and I have read of fatal results. The resim is considered by natives to be useful in easing colic and stomachic pains and warming if taken internally; and externally, it is reputed to be antiseptic, but I have not yet been able to find out why! It is, however, mostly used internally in hysteria. It makes a very bright show when in full flower, its rosy red bloom being both delicate and graceful.

Ixora coccinea, Vern. "Bakora." Torch tree. A shrub with smooth obovate leaves, flowers bright scarlet in close umbels or corymbs, calyx minute, corolla lobes, broad pointed. It is rather like a geranium and is called also the "jungle geranium," and it is probably the Bandhuka of Sanskrit poetry.

Origanum Marjoram, Vern. "Marva." Majoram. A plant with no particular beauty, it contains a volatile oil which is used for different purposes and being aromatic in character is or has been used in temples because it gave fore a sweet smelling savor for the deities; and its medicinal properties also make it acceptable as a plant for the deities and for the native as well. Now besides the plants that are sacred to the deities already given, there are a number more which are sacred to other deities or groups of deities and the first of these is Kama or Kama Devi, the Hindu cupid or god of love. He is the son of Lakshmi and is represented similarly to the way cupid is at the present day, but he may ride on a red parrot or lory.

The plants sacred to him are: *Mesua Ferrea, Pandamus fascicularis, Mangifera Indica,* and *Michelia champaca* (already described).

Mesu Ferrea, Vern. "Nag Champa." Mesua. A beautiful tree sometimes growing sixty or seventy feet high with oblong lanceolate leaves, shining above and whitish beneath. Flowers, solitary or in pairs, large silvery white with bright yellow anthers. Fruit, oval and pointed. A tree which has been considered by

some as the most beautiful on earth and with blossoms of a delicately fragant odour, and fit indeed for Kame-Devis quiver. In Ceylon it is near every Buddhist temple and the flowers have been said to resemble white roses, while the shorts and buds of the tree are of deep crimson. The flowers also have been described as camellia-like in character and its foliage a mass of glossy green. Its timber is splendid, and Wordsworth's quotation matches it well:

"A silver shield with boss of gold
That spreads itself some fairy bold
In fight to cover."

It yields an aromatic oleo-resim and the dead flowers are used as a fragrant adjunct for decoctions and oils.

Pandamus fascicularis, Vern. "Kevri." Screw-pine. A cactus-like shrub (there are no true indigmous cactuses in India) with long sword-shaped sharply toothed spinous leaves. The flowers look like innumerable filaments and grow on a spadix 3 or 4 inches long, inclosed in leaf-like bracts. Fruit nearly round, something like a pineapple. The tender white leaves of the flowers have a delightful fragrance. Roots are sent out from many parts of the stem and give the idea of the tree being propped up by them. It is the Kevada or Sanskrit poetry, and a perfumed oil is extracted from the flowers which is called 'Kevde.'

Mangifera Indica, Vern. "Amb." Mango tree. Smooth, leaves oblong and lanceolate. Flowers, small in greenish yellow panicles, fruit large and greenish and yellow, and varying somewhat in shape from oval to irregularly round. A fine tree which grows all over India and has been planted everywhere. The fruit is easily the finest Indian fruit and possesses a subtle and delicate flavour, its only disadvantage being its immense stone. It has the reputation that it must be eaten in one's bath on account of its difficulty to handle, but I have not found it necessary to go to such length to enjoy it. The tree when in full bloom and many together, is rather pretty, though individually the flowers are modest. The smell of the flowers by night when out driving along the jungle roads is rather strong and some think them oppressive. The best ones are the Bombay Mangoes, famous all the world over. Every village temple or shrine is well planted with

them, for they afford good shade as well as a most nourishing fruit. The unripe fruits are made into sherbets, pickles, chutnies. The stone or kernel contains tannic acid and turpentine and the pulp of the ripe fruit gallic acid, and gum in traces. The Am Chur which is very popular amongst Indian native troops is a valuable anti-scorbutic. This form of the fruit is that of the green mangoes dried, skinned and stoned, cut into pieces. Half an ounce of this is said to be equal to an ounce of good lime juice. Mango food is a favorite diet with Europeans, just as gooseberry food is at home, and in my opinion it has a very strong resemblance in flavour.

I now come to the plants sacred to the Hosts of Heaven, by which we mean the nine regents of the planets and eclipses, and these give their names to the days of the week, and I give them as they may prove interesting to readers of the article generally.

Rair, the sun regent, Sunday. Soma, the regent of the moon, Monday. Mangala, Tuesday. Buda, regent of Mercury, the author of a hymn in the Rig-veda, Wednesday. Brihapati, Thursday. Sukra, Friday. Sani, Saturday. Rahu and Ketu, eclipses.

To these Hosts of Heaven are sacred the:

Hibiscus Rosa-Sinensis, Butea frondosa, Acacia Catechu, Ficus religiosa (already described), *Ficus glomeratus, Poa cynosuroides.*

Hibiscus Rosa-Sinensis, Vern. "Jasud." Shoe flower. The different varieties of Hibiscus are numerous in India and form beautiful shrubs and useful vegetables, and all are more or less formed on one type, that of a variety of mallow, to which natural order they belong. The above is probably better known as the China rose and is common in gardens in India and I believe is to be found in different parts of America and elsewhere, and so will be more or less generally known to your readers It is a rather pretty plant and the flowers are used in various disorders But I wonder if anyone of your readers know that an oil is made by mixing the juice of the fresh petals with olive oil in equal parts and boiling till the water is evaporated is useful as a stimulating application to the hair. Possibly some ladies may care to know of a new hair wash or a hair producer. Anyhow the natives out

here believe it to be useful and it seems to me to be a very simple preparation.

Butea frondosa, Vern. "Pallas.' The bastard teak. The vernacular name of this tree is taken from the famous field of Plassy on which our fortunes in India so much depended. It is a common jungle tree in early spring and when in flower is covered with beautiful scarlet-orange flowers which make a wondrous colour effect. Hence its fancy names "flame of the forest," and "pride of the jungle," which nearly all Anglo-Indians know it by. Seen closely the individual flowers are much the same colour, but the calyces which are of a very deep greenish-brown, and exactly like velvet, throws the scarlet into showy relief, and as the flowers are in panicles the effect is more striking still.

The bark of the tree contains a gum, which is full of tannic and gallic acids. The gum and flower juice is used for making dyes. The bark is used for snake-bites.

It is indeed a flower which
"With a scarlet gleam
Cover a hundred leagues, and seem
To set the hills on fire."

Acacia Suma, Vern. "Khair." Catechu. A small tree with white bark, thorny, leaves compound, leflets 30 to 50 pairs, flowers white, pod strap-like. A well known rather delicate tree, but not a particularly interesting one to look upon. Catechu, its English name, is an extract from this tree, and is so well known that no coments are necessary on it. Its chief use in India is that it is one of the ingredients of the packet of Betel leaves chewed by the natives, which I suppose is one of the common things one notices travelling through the country any where. Be it remembered, however, that this packet, however objectionable it may be to us and however discolouring to the mouth and lips, contains several useful ingredients which probably make life more agreeable to the native and certainly in some cases staves off sickness, colic, etc.

Kath-Bol is a mixture of catechu and myrrh given to women after confinement as a tonic and to induce a flow of milk.

Ficus glomerata, Vern. "Gular." The Gular fig. A large tree with leaves oblong or broadly lanceolate, fruit in clusters on the trunk or branches, small, red downy. The wood is a fair timber, and the fruit is edible. A bath made of the fruit and bark with water is regarded as a cure for leprosy. The liquid extract from the root is used as a tonic from the Vaidvans. It is a fairly common tree over the country and may often be recognized quickly by the growth of galls on its leaves.

Poa cynosuroides, Vern. "Kust." Dharba grass. This is not a grass as its name suggests, but belongs to the natural order, Boraginaceae, and grows on damp marshy swamps.

Brahmins always keep it in their houses and it is used in all ceremonies, including sacrifices.

It grows to a height of two feet and has a finely pointed top and is rough to the touch.

There are several legends regarding the origin of this sacred plant. One, that it was produced at a time when gods and giants were all busy churning with the mountains of Mandara, the Sea of Milk in order to extract from it Amrita or nectar which would render them all immortal. The story goes on to say that while the mountain was rolling about on Vishnu's back, who in the form of a turtle was supporting it, it rubbed off a great many hairs from the god, and that these hairs cast ashore by the waves, took root there and became Dharba grass. One wonders where the hairs on a turtle's back are, but this is a legend. Another legend is that while the gods were greedily drinking the nectar which they had extracted from the Sea of Milk, let fall some drops on the ground among ordinary grass which thus became sacred and grew up as Dharba grass

Dharba grass although sacred to the hosts of Heaven is also considered to be part of Vishnu himself, and Brahmins worship it, and in their ceremonies use it, believing that it has the virtue of purifying everything. An annual feast is instituted in honor of it on 8th day of the Moon in the month of Badra (September), and is called Dharba-ashtami. By offering the grass as a sacrifice on that day immortality and blessedness for ten ancestors may be assurred. Another result is that one's posterity is increased and

multiplied like Dharba grass which is one of the most prolific plants in the vegetable kingdom.

We have still another set of sacred trees which are sacred to the nine forms of Kali. The Kali represented in India in ancient days the same as the old Roman patricians and refer to the ghosts or shades of ancestors. It will be noticed that some of those plants which are referable to deities are also to these spirits, such as *Aegle marmelos, Ocymum,* etc. But there are certain of special ones also, *Musa sapientium, Curcuma longa, Saraca Indica, Punica granatum.*

Musa sapientium, Vern. "Khela." The cultivated plantain. Its appearance is now probably well known all the world over now-a-days, and need hardly be described. Its specific name conveys an allusion to one of Theopharastus' statements concerning a fruit which served as food for the wise men of India, supposed to have been the plaintain.

It is worshipped by the Hindu woman on the 4th of Kartik Shudh in order that their husbands may survive them. Bunches the fruit are used in festivals and ceremonies, and are placed at the entrances to their houses on such occasions, especially at marriages, as appropriate emblems of plenty and fertility.

Some people consider it to have been the forbidden fruit of Eden and again that it was the grape of the Promised Land.

Curcuma longa, Vern. "Haldi." Twemerie. Herbaceous. The leaves are long, broad and lanceolate, the leafy stem is four to five feet high. The flowering bracts pale green and the coma a beautiful pink. The plant is known in Bombay by its Hebrew name "Karkam," and it was evidently known in England as early 1710 or earlier. The uses of twemerie are well known, and I only intend to say that the oil is used by the natives in small-pox and chicken-pox. The rubbing of the oil is an essential part of Hindu wedding ceremonies and the root enters into many religious ones. By the root, I mean tuber underground. Mixed with lime, it forms the liquid used in the Arati ceremony of warding off the "evil eye." With lime juice, the Hindus of the sect of Vishnu prepare their yellow Tiruchurnum, with which they make the

peculiar mark on their forehead. Visitors to India must often have seen the numerous marks of different sects and castes.

Punica granatum, Vern. "Anar." The Pomegranate. It is sufficiently well known with its scarlet orange flowers and avidulated fruit to need no description. It grows well in other parts of Asia and Greece as well as India, where it was and is held sacred and symbolic of fructification and procreation and also death and resurrection.

Giotto placed a pomegranite in the hands of Dante, and Raphael crowned Theology with blossoms of its flowers.

In the old testament it is referred to, and it is seen in Assyrian and Egyption sculpture. In India it has often been referred to by Sanskrit writers, and has been seen in its sculpture. Several alkaloids are obtained from various parts of the plant and also organic acids and mannite.

Saraca Indica, Vern. "Ashoka." The Asoka tree. A small tree belonging to the Leguminoseae, but unlike the usual type, it hardly looks like a flower of this order. The flowers are orange, changing to red in large round heads with long stamens. The pod is broad, flat or scimitar shaped. It is a beautiful sight to see when in full bloom, and its soft Hindu name occurs frequently in old Indian poems. The flowers are used in temple decorations and as a symbol of love is also dedicated to Kama. It possesses a certain charm in preserving chastity and it is also a tree of refuge, as in the legend of Buddha, when Maya is conscious of having conceived the Buddis-Attya, she retires to a wood of Asoka and sends to her husband.

The tree is also held sacred by the Burmans as under it Gaudama was supposed to have been born.

It is much used by native physicians in womb affections, the bark being mixed with milk and made into the form of a decoction. Asoka Grita is made from the bark and clarified butter to which some aromatic herbs are added.

There are a few other plants which are held sacred, but which I must omit from this article if I am to endeavour to keep it within reasonable limits. The ones I have told something about are important and fairly common ones, and the writer

trusts they may prove interesting, both to those who have had a tour through India and to those who intend coming, and serve as a sort of brief popular botanical and folk-lore appendix to guide-books which may not touch upon this part of sight-seeing in detail.

The foregoing paper was discussed by H PIERS, F. W. W. DOANE, DR. A. H. MACKAY, PROF. MOORE, and D. M. FERGUSON; and a vote of thanks was passed to DR. BARBOUR for his interesting paper, on motion of Messrs. Piers and McCallum.

THIRD ORDINARY MEETING.

N. S. Technical College, Halifax; 8th January, 1912.

THE PRESIDENT, WATSON L. BISHOP, in the chair.

It was announced that CAPTAIN J. H. BARBOUR, Royal Army Medical Corps, F. L. S., of Jabalpur, C. P., India, had been duly elected a corresponding member by the council on 28th December.

HARRY PIERS, curator of the Provincial Museum, Halifax, read a paper entitled "Brief Account of the Micmic Indians of Nova Scotia, and their Remains," the subject being illustrated by a typical set of specimens of their ancient and modern implements, customs, etc. (See Transactions, p. 99). The paper was discussed by the PRESIDENT, DR. A. H. MACKAY, DR. E. MACKAY, DR. A. STANLEY MACKENZIE, D. M. FERGUSON and WILLIAM MCKERRON.

FOURTH ORDINARY MEETING.

THE FIRST VICE-PRESIDENT, DR. A. H. MACKAY, in the chair.

H. JERMAIN MAUDE CREIGHTON, M. A., M. Sc. DR. Sc., F. C. S., lecturer on physical chemistry, Dalhousie University, Halifax, read a paper on "The Optical Activation of Racemic Bromcamphor Carboxylic Acid by means of Catalysts: the Specificity of Catalysts." (See Transactions, p. 1). The subject was discussed by PROF. E. MACKAY, DR. A. H. MACKAY, D. M. FERGUSON, and PROFESSORS BRONSON, MACINTOSH and HARRIS.

FIFTH ORDINARY MEETING.

N. S. Technical College, Halifax; 11th March, 1912.

THE PRESIDENT, WATSON L. BISHOP, in the chair.

It was announced that DAVID FRASER HARRIS, M. D. C. M., D. Sc., B. Sc. (Lond.), F. R. S. E., Professor of physiology and histology, Dalhousie University, had been elected an ordinary member by the council on 29th February.

HAROLD S. DAVIS, B. A., Instructor in physics, Dalhousie University, Halifax, read a paper on "The Conductivity of an Aromatic Base in Water and certain Organic Solvents." (See Transactions, p. 40). The subject was discussed by DR. H. J. M. CREIGHTON and PROF. E. MACKAY.

H. JERMAIN MAUDE CREIGHTON, M. A., M. Sc., DR. Sc., F. C. S., lecturer on physical chemistry, Dalhousie University, Halifax, read a paper on "The Behavior of Iron Salts, in the presence of Egg Albumen and other Organic Substances, towards certain Reagents." (See Transactions, p. 61). The subject was discussed by C. B. NICKERSON, PROF. E. MACKAY, DR. A. H. MACKAY, and D. M. FERGUSON.

SIXTH ORDINARY MEETING.

N. S. Technical College, Halifax; 9th April, 1912.

THE SECOND VICE-PRESIDENT, D. M. FERGUSON, in the chair.

In the absence of the author, MR. PIERS read a paper by LAWRENCE W. WATSON, M. A., Charlottetown, P. E. I., on "The Geological Age of Prince Edward Island." (See Transactions, p. 145). The paper was discussed by R. H. BROWN, H. PIERS, and others; and a vote of thanks was passed to MR. WATSON.

C. B. NICKERSON, M. A., Demonstrator in chemistry, Dalhousie University, Halifax, read a paper on "The Qualitative Separation of Metals of the Iron Group; a New Method for the Removal of PO_4''' Ions." (See Transactions, p. 95). The subject was discussed by DR. H. J. M. CREIGHTON.

DAVID FRASER HARRIS, M. D., D. Sc., B. Sc. (Lond.), F. R. S. E., Professor of physiology and histology, Dalhousie University, Halifax, read a paper entitled, "On the Intimate Associations of

Inorganic Ions with Native and Derived Proteins." (See Transactions, p. 76). The paper was discussed by DR. CREIGHTON, L. C. HARLOW, and D. M. FERGUSON.

SEVENTH ORDINARY MEETING.

THE PRESIDENT, WATSON L. BISHOP, in the chair.

MR. PIERS reported that the council had under consideration the celebration of the fiftieth anniversary of the foundation of the Institute in December, 1862, the celebration to take place in December of this year, and that a committee had been appointed to deal with the matter and to report to the council, and that this committee would be glad to consider any suggestions from the members in general.

The SECOND VICE-PRESIDENT, D. M. FERGUSON, took the chair, while the PRESIDENT, WATSON L. BISHOP, read a paper on "The Canada Grouse (*Dendragapus canadensis*) in Captivity: its food, habits, etc." (See Transactions, p. 150). The subject was discussed by H. PIERS.

J. H. L. JOHNSTONE, B. Sc., Demonstrator in physics, Dalhousie University, Halifax, read a paper on "The Electrical Resistance and Temperature Coefficient of Ice." (See Transactions, p. 126). The paper was discussed by DR. CREIGHTON, and a vote of thanks was presented to Mr. Johnstone.

A paper by A. H. MACKAY, LL. D., F. R. S. C., superintendent of education, on "Phenological Observations in Nova Scotia, 1911," was read by title. (See Transactions, p. 175).

HARRY PIERS, curator of the Provincial Museum, read a paper on "Mastodon Remains in Nova Scotia." (See Transactions, p. 163). The subject was discussed by D. M. FERGUSON.

A paper by H. JERMAIN MAUDE CREIGHTON, M. A., M. Sc., DR. Sc., F. C. S., lecturer on physical chemistry, Dalhousie University, Halifax, "On the Electrical Conductivity of Acetophenone Solutions of certain Alkaloids and other Organic Bases," was read by title. (See Transactions, p. 154).

HARRY PIERS,
Recording Secretary.