

Transactions and proceedings of the New Zealand Institute, vol. 11, 1878

CURL,—*On Pituri, a new Vegetable Product.*

411

seeds, and although if left to ripen, its seed-stalks are dry, and not so nutritious as the *Milium effusum*, yet the very great quantity of seed and heavy crop produced to the acre, makes it a plant worthy of culture for fodder in suitable places, and in rotation.

A large variety of *Vetches*, some of which I obtained from Malta, have proved themselves more prolific and of greater forage value than either the summer or winter vetches more usually grown, both for cutting when green and in the autumn cutting, and burying in pits or silos, as managed in France, and in the winter digging out and feeding stock on the farms. The farmers might greatly increase the numbers of live stock kept and fattened on the farm by adopting this plan.

Chicklin vetches I have found abundant bearers of seed, and a useful forage plant that all live stock will eat whenever they can get them, and it would fatten them quickly.

Having extended this paper to as great a length as I dare venture to trespass upon the Society's time, although there are so many other plants that deserve to be noticed and introduced, yet a notice of them must await a future opportunity if the Society should desire it.

ART. LIX.—*On Pituri, a new Vegetable Product that deserves further Investigation.* By S. M. CURL, M.D.

[Read before the Wellington Philosophical Society, 31st August, 1878.]

THE Wellington Philosophical Society being the recognised medium of bringing before the scientific and general public any scientific matter, I venture to urge upon its experimenting members the desirability of further investigating a peculiar vegetable substance called Pituri, that has lately been studied and investigated by myself and others.

Pituri consists of the dried leaves and other parts of plants that contain organic elements, and when swallowed by individuals, appears to enable them to sustain a severer and more continued exertion than they would be able to bear without its use.

It has been long known to those acquainted with the habits of the aboriginals of Australia, that they used a substance bearing in the different tribes different names; that when they were going upon long journeys over desert tracks, where they would not be able to get food or water, or when they were about to undertake any unusual exertion, or when any question of moment to them would require more mental exertion than usual, or

when in short they would be called upon to sustain any severe strain upon their mental or physical power, they would then take out of a bag, in which they carried it, some dried vegetable substance, and would chew or masticate small quantities of it, and would at intervals during their desert travel masticate and swallow small portions of this substance, and they could thus for days sustain themselves without food, until they could reach places where food, etc., was again procurable.

It is further known that the individuals of the several tribes valued this material very highly, and that they obtained it from a distant tribe, paying for it by a kind of barter, and that the users did not know the plant from which it was gathered.

The knowledge of these facts had caused various scientific persons in Australia—Baron von Müller, Dr. Bancroft, and others—to be very desirous to learn more about this material, and to investigate its properties.

When Mr. Gilmore upon one occasion was travelling, he came across a tribe who, being remarkable in other respects, claimed to have certain of their old men who knew where the Pituri was procured, and the plants from which it was obtained. Mr. Gilmore was afterwards fortunate enough to procure specimens of the dried Pituri, and gave portions to several scientific persons to experiment with.

Dr. Bancroft made several very interesting experiments with this material, both in its dried state and also with an extract prepared from it.

Baron von Müller, having received a portion and examined it microscopically and otherwise, believed that a considerable part of the dried substance was the leaf of a small tree or shrub, which he defined as *Duboisia hopwoodii*, which is indigenous in several of the warmer parts of Australia. Having procured, through the kindness of Mr. Barley, a supply of the dried Pituri, I was able to investigate it, and to confirm the results obtained by Dr. Bancroft to some extent, which results shall be as briefly as possible related hereunder, with a view to inducing all who have the means to further investigate this very curious, and as it appears, very important substance, which promises not only to be a very valuable medicinal remedy, but to be what it is claimed the coca of the Peruvians is (the dried leaves of the *Erythorxylon coca*), a nervine and stimulant that sustains function, and retards tissue waste.

Before giving the results of my experiments with Pituri, it will be well to see what Baron von Müller and others say of it.

“The natives of Central Australia chew the leaves of *Duboisia hopwoodii*, just like the Peruvians, and Chilians masticate the leaves of the coca (*Erythorxylon coca*) to invigorate themselves during their long foot-journeys through the desert. I am not certain whether the aboriginals of all districts

in which the Pituri grows are really aware of its stimulating power. Those living near the Barcoo, travel many days' journey to obtain this to them precious foliage, which is carried always about by them broken into small fragments and tied up in little bags. It is not impossible that a new and perhaps important medicinal plant is thus gained. The blacks use the *Duboisia* to excite their courage in warfare; a large dose infuriates them.

“(Signed) FERD. VON MUELLER.

“15th February, 1877.”*

Mr. W. O. Hodgkinson, writing to Dr. Bancroft on February 15, 1877, after giving a description of the localities where he found the plant, etc., says:—“The resident natives carry on a considerable traffic in this plant, representatives of tribes from other quarters coming to procure it. It is used, after being sweated beneath a coating of fine sand, as a narcotic stimulant, strictly kept for the solace of the old men, or for occasions when long privations have to be endured, or some solemnity performed. * * *

* * When used on the march, a portion is put into the mouth chewed, until it assumes the form and consistency of a sailor's quid, passed round each one of the party, the saliva promoted by its use being swallowed. *

* * * * When with Burke and Wills' expedition, subsequently with Mr. John McKinlay, and recently in the North West Expedition, I used Petchere, or Petury, or Pituri, habitually when procurable, in default of tobacco, and have very often chewed it both in its raw and prepared state.”

Dr. Bancroft tried experiments upon dogs, cats, rats, and frogs, and gives the results of its effects upon them:—

“1st. Period of preliminary excitement from apparent loss of inhibitory power of the cerebrum, attended with rapid respiration; in cats and dogs with vomiting and profuse secretion of saliva; in dogs there is retraction of the eye-ball.

“2nd. Irregular muscular action, followed by general convulsion.

“3rd. Paralysis of respiratory function of medulla.

“4th. Death; or

“5th. Sighing inspirations at long intervals.

“6th. Rapid respiration, and returning consciousness.

“7th. Normal respiration, and general torpidity, not unattended with danger to life.

“Death is caused chiefly as in tetanus, by excessive contraction of the respiratory muscles and suffocation. Pituri does not dilate the pupil when applied locally, though dilation is seen to some extent. When given by subcutaneous injection, the extreme retraction of the eye-ball in dogs is very remarkable.” He goes on to say:—“In small medicinal doses we

* This was in a letter to the Editor of the *Australian Medical Journal*.

may expect to find the period of excitement and the torpidity to be the only marked symptoms." And further he adds:—"Of the medicinal uses of Pituri little at present can be said. I have given it in some cases of extreme debility, but in doses much too small to enable me to speak of its value. I would expect it to be a tonic nervine, that could be used along with alcohol."

My experiments with Pituri were made with the leaves themselves, with the infusion, and with the extract of the leaves, and were performed upon domestic animals and myself. The results were somewhat similar to those of the gentlemen herein referred to; but as I had not a sufficiency of the Pituri for a very extensive series of experiments, I used up what I had, and am waiting for a further supply before continuing others. The results I have at present arrived at are: When the leaves are chewed by a man unaccustomed to its use, it excites increased flow of saliva; a slight dilation of the pupil; the heart's action is accelerated, the beats being increased in number by from five to eight in the minute; a pain in the hind part of the head is felt; the respirations are reduced in volume; there is slight nausea.

These symptoms pass off after a short time. Then is felt increased muscular irritability; a feeling of greater power; an inclination exists to move the muscles in some vigorous manner; the heart beats stronger; the diaphragm acts more forcibly; respiration is performed slower; muscular exertion is more easily done, and greater exertion can be made without fatigue; a desire for muscular movement continues for a long time; partial anæsthesia of the skin is felt for some hours; sense of touch is lessened; no feeling of hunger or thirst is felt, if food or drink is not taken for twenty-four hours; the excretions are decreased in quantity, and chemical constituents altered; there is less carbonic acid in the air expired than normal.

If the extract or infusion is given to animals so that it enters their system by the digestive organs, much the same train of symptoms is observed; but if it is injected subcutaneously, then the symptoms more nearly approach those described from the observations of Dr. Bancroft.

From such experiments as I have hitherto been able to make, I have no doubt that the active principles of the Pituri, acting as it does upon the great nerve centres and ganglions, and also on the muscles, increasing the irritability of their muscular fibre elements, and while it is acting upon the nerves and muscles, the growth of cells is retarded, and thus tissue change is modified and lessened, the individual under its influence being thus able to undergo exertion without food, which without it, he could not sustain.

It is, therefore, one of the few active agents that hereafter will be of considerable service to the physician and others, that when properly given or used, will prolong and preserve life, by carrying on the organic functions

over the crises of diseases, or enable exertion or effort to be sustained, when without it death or very severe disease would ensue. But it will be well here to insist that it be in all cases swallowed, and not used by subcutaneous injection, as it thus acts quite differently in some respects, and is modified in others, and would always be better given medicinally in that way, than when subcutaneously injected, as when swallowed it is mixed with the saliva and gastric fluids, which modify its action, whereas if injected under the skin it is absorbed, and acts in a different, as well as a more sudden and violent manner. I am not now able to speak as to the doses that will be most beneficial, as my supply of Pituri is exhausted, but small and repeated doses of the leaves, or a powder thereof masticated, or mixed with some linctus, or in the form of lozenges, so that it will be well mixed with the saliva, are the best forms of using it. But as it can be more fully studied, no doubt other facts will reveal themselves with regard to it and to its uses and proper place in the *materia medica*. At all events, if these observations cause others to examine this important agent, and when it is better known, and health is gained or life is saved by this drug, my object in bringing this matter before the Society will be gained.

ART. LX.—Notes on *Cleistogamic Flowers of the Genus Viola*.

By GEORGE M. THOMSON.

[Read before the Otago Institute, 14th May, 1878.]

It is a well-known fact that, owing to the poverty of insect life in these islands, the number of *entomophilous* plants, *i.e.*, those requiring insect aid in securing fertilization, is small in comparison with most other parts of the world. Hence, also, the comparative want of gaily-coloured flowers, and the prevalence of white, green, and inconspicuous flowers. As every fact bearing on the question of fertilization of flowers gives us additional insight into the relations of the indigenous fauna and flora, I make no further apology for communicating the following notes to the Institute.

There are many plants which produce two kinds of hermaphrodite flowers, *viz.*, tolerably large and conspicuous flowers, fitted for cross-fertilization by means of insects, and small, closed ones, more or less depauperated, and sometimes produced underground, fitted only for self-fertilization. These last are known as *Cleistogamic* (Gr. *kleistos*, closed; *gamos*, union). In Darwin's latest botanical work, "On Different Forms of Flowers," there is given a list of fifty-five genera, certain species of which produce these flowers. Of the genus *Viola*, fifteen species are named, which produce,