stand the nature of the accident, he will be able to adapt his remedial measures to the emergency. The special means adopted may infinitely vary, (as in uterine hæmorrhage); but the general principles of treatment are immutable, and simple, and ought to be engraven in the mind of every accoucheur. The amount of success attending their application must depend upon the promptness, nerve, and sagacity of the practitioner.

Essex House, Putney, September 1, 1850.

ON THE GALACTAGOGUE AND EMMENAGOGUE EFFECTS OF THE LEAVES OF THE BOFAREIRA (RICINUS COMMUNIS, OR PALMA CHRISTI).

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DR. W. O. M'WILLIAM has often mentioned to me, that he had become aware of the galactagogue properties of a plant common in the Cape de Verde islands, and expressed his intention of publishing an account of a phenomenon so novel and important. In August, just passed, Dr. M'William submitted to me a paper which he proposed to read at the Edinburgh meeting of the British Association for the Advancement of Science. Struck by the facts related in Dr. M'William's paper, and learning for the first time that the plant is no other than the *ricinus communis*, which grows as an annual plant in this country, I determined, according to Dr. M'William's wish, to ascertain whether the plant, when growing in our latitudes, preserves its remarkable properties of stimulating the mammary glands.

In Dr. M'William's interesting paper, read before the Physiological sub-section of the British Association, and subsequently published in the *Lancet* (Sept. 7th, 1850), the following description of the mode of using the Bofareira or Ricinus, the plant referred to, is given:

"In cases of childbirth, when the appearance of the milk is delayed (a circumstance of not unfrequent occurrence in those islands), a decoction is made by boiling well a handful of the *white* Bofareira in six or eight pints of spring water. The breasts are bathed with this decoction for fifteen or twenty minutes. Part of the boiled leaves are then thinly spread over the breasts, and allowed to remain until all moisture has been removed from them by evaporation, and probably, in some measure, by absorption. This operation of fomenting with the decoction and applying the leaves, is repeated at short intervals until the milk flows upon suction by the child, which it usually does in the course of a few hours.

"On occasions where milk is required to be produced in the breasts of women, who have not given birth to or suckled a child for years, the mode of treatment adopted is as follows:

"Two or three handfuls of the leaves of the Ricinus are taken and treated as before. The decoction is poured, while yet boiling, into a large vessel, over which the woman sits so as to receive the vapour

over her thighs and generative organs, cloths being carefully tucked around her so as to prevent the escape of the steam. In this position, she remains for ten or twelve minutes, or until, the decoction cooling a little, she is enabled to bathe the parts with it, which she does for fifteen or twenty minutes more. The breasts are then similarly bathed, and gently rubbed with the hands; and the leaves are afterwards applied to them in the manner already described. These several operations are repeated three times during the first day. On the second day, the woman has her breasts bathed, the leaves applied, and the rubbing repeated three or four times. On the third day, the sitting over the steam, the rubbing, and the application of the leaves to, with the fomentation of, the breasts, are again had recourse to. A child is now put to the nipple, and, in the majority of instances, it finds an abundant supply of milk.

"In the event of milk not being secreted on the third day, the same treatment is continued for another day; and if then there still be want of success, the case is abandoned, as the person is supposed not to be susceptible to the influence of the Bofareira.

"Women with well-developed breasts are most easily affected by the Bofareira. When the breasts are small and shrivelled, the plant then is said to act more upon the uterine system, bringing on the menses, if their period be distant, or causing their immoderate flow if their advent be near."

In directing the use of the Bofareira leaves, which I have procured from the Botanical Gardens at Chelsea, Kew, and the Regent's Park, I have followed as nearly as possible the description of Dr. M'William, with the exception of the application of the steam of the decoction to the generative organs. The following are the cases in which the agent has been used under my directions.

-The following case was conducted by Mr. C. Stillman, one of the House Surgeons of Queen Adelaide's Lying-in Hospital.

CASE I. Mrs. C——, twenty-four years of age, rather tall and thin, mother of two children, had weaned the last about six weeks, and had still a little milk, of a very thin serous character, left in the breasts. She commenced the use of the Bofareira, on the morning of Wednesday, August 21st, by bathing the left breast only, with a strong decoction of the leaves. The leaves themselves were afterwards applied to this breast. In the evening, she repeated the bathing; after which, she perceived, on squeezing the nipple, that her milk, which was at first thin and watery, had now become quite thick. After repeating the application on Thursday the 22nd, she felt throbbing pains in the breast, accompanied by sickness and pains in the back, which she described as being like after-pains, and the areola surrounding the left nipple had become much darker than the right; the glandular follicles were also larger than in the nipple which had not been under the influence of the Bofareira. The difference between the two breasts was very marked. Having at this time no more leaves, she was unable to continue the application. On the following day, a fresh supply of the leaves was obtained, and she again bathed her left breast as before. After two applications, the *catamenia* appeared, before the regular time, and the fomentations were not afterwards continued.

CASE II. Mrs. H——, mother of four children, her youngest child aged one year and five months, had been weaned more than six months. During the latter months of lactation, she had little milk; the breasts were small, and the nipples contracted. Before applying the Bofareira, the breasts were carefully examined, to learn if they still contained any traces of milk. After much trial, she could squeeze from her left breast the smallest points of serum from the mouths of two or three of the galactophorous ducts, as is the case with most women who have suckled; but from the right breast not a trace of moisture could be expressed. The Bofareira was used night and morning for four days, by bathing with the decoction, and the application of the hot leaves to both breasts, in the manner described by Dr. M'William. After the second application, thick milk, like the colostrum, could be squeezed from both nipples, the breasts were considerably swollen, the glands in the axillæ were also painful, and pains extended down the arms. There were, in fact, in this case, all the symptoms present, in a minor degree, which are usually observed in the establishment of the milk after parturition. Mrs. H—— had also distinct periodical pains in the back and abdomen, which she compared to after-pains. A leucorrhœal discharge was also produced. At the end of the fourth day, milk flowed so freely into a breast-pump, that there was no doubt she could have suckled a child; but at this point the application of the Bofareira was omitted, and the milk has since gradually disappeared.

CASE III. Mrs. D——, a married lady, without family, hearing of the use of the Bofareira in the last case, wished it tried upon herself. As there was no possibility of injury she was supplied with some of the leaves, and proceeded to use it. The application, and the use of the decoction, produced swelling of the breasts, pain in the back, and an increase of a leucorrhœal discharge, to which she is subject; but there was no appearance of milk in the breasts. At the time of using the Bofareira, the catamenial discharge had ceased about a week.

CASE IV. M. L——, a young woman, who had been delivered three weeks, but whose milk, though profuse, was so poor as to be little more than serum, used the Bofareira three times. Under its use, the secretion from the breasts became markedly thicker; but the child was unfortunately attacked with diarrhœa, and it was not thought advisable to continue the use of this agent longer.

CASE V. L. M——, a young woman, mother of one child, but who had weaned her infant about a year and a half, applied the Bofareira in the form of decoction and poultices two or three times; but the pain and swelling were so considerable, that she refused to go on with it. She had a little serum in the breasts, at the time when the use of the Bofareira was commenced. The secretion speedily became milky. This patient had a leucorrhœa, which had been present ever since the weaning; and the uterine and vaginal irritation, upon which the leucorrhœa depended, had kept up, in all probability, the serous secretion from the breasts, which is common enough in leucorrhœal cases.

Dr. M'William makes the following observations on the botanical name and characters of the Bofareira:

“The Bofareira grows in most, if not in all, the Cape de Verde Islands.

That used by the natives for the purposes I have mentioned, is called by them the *white* Bofareira, to distinguish it from what appears to be nothing more than a variety of the same species, the *red* Bofareira. The *white*, or that which possesses galactagogue qualities, is recognized by the natives by the light green colour of the stem of the leaf, whilst the leaf stem of the *red* is of a purplish red hue. The latter plant is carefully avoided, as it is said to be a powerful irritant, and if applied, as it occasionally has been, by mistake for the *white*, it produces an immediate and often immoderate flow of the menses.

"I regret not having been informed of the alleged difference in the action of the white and red Bofareiras, while I was at the Cape de Verde, that I might have examined the latter plant upon the spot.

"The seeds of each plant were, however, kindly forwarded to me by Mr. George Miller, and Sir William Hooker most readily and obligingly examined them. Sir William, in a note to me, says, 'What you mark as red Bofareira, and as white Bofareira, are both not only of the genus '*Ricinus*,' but also of one and the same species—viz. *Ricinus communis*, the common palma Christi, or castor-oil plant. In our gardens, as well as abroad, the plants vary; and your two plants vary a little in the form and size of the seed, and especially in the colour, but they are one and the same species.'

I have now used the leaves of the plants from the Botanical Gardens at Kew, the gardens at Chelsea, and the Botanic Gardens in the Regent's Park. At the garden in the Regent's Park, there are two fine plants, and I was struck with the red appearance of the stalk, and of the leaf stems and ribs of the leaves. The colour was nearly as deep as that of the common rhubarb. The leaves of these plants were also larger than any others I have seen. Inquiring of one of the gardeners, I was informed that there were two varieties, the *ricinus communis* major, and minor, and that the major was always of the same red colour. The smaller variety is of the green colour described by Dr. M'William. This probably is the explanation of the red and the white Bofareira of the Cape de Verd Islands.

Hitherto, the control we have had over the mammary secretion has not been very complete; *a priori*, there would seem no reason why we should not possess special excitants and sedatives of the mammary glands, as well as of other secretory organs. Abstinence and saline purgatives, local frictions and applications, have generally been relied on as lactifuges, when the arrest of the secretion has been desirable, either after parturition or at the close of lactation; but we have had no means of equal efficacy as galactagogues, in cases requiring increase of the milk secretion.

I believe Dr. Fleetwood Churchill has used opium as a galactophorous remedy, believing that it stimulates the mammary glands in common with the skin, while it diminishes all the secretions of the internal glands. Some persons have also given castor-oil as a purgative, with an idea that it increases the milk; but it has been thought that it produces this effect by moderating febrile excitement. In cases of arrest of the secretion from the breast in fever, and inflammatory diseases, all the febrifuge and antiphlogistic means become indirect restorers of the mammary secretion. There is a popular notion, that a fish diet produces more

milk than a meat diet. Fluids of all kinds stimulate the breasts during lactation, in common with the kidneys; but their effects in increasing the flow of milk are mechanical. It is a common plan for cow-keepers to give the milch-cows drink before milking them.

Some considerable control over the secretion of the breasts is given by the synergies or sympathies which exist between the breasts and other organs. It is known that the Arabs procure a supply of milk from their mares by irritating the vagina. In the human subject, irritation of the vagina and uterus in disease, will excite the secretion of milk. Milk is frequently found in the breasts in cases of tumours, in gonorrhœa, and in leucorrhœa. No doubt it is the irritation of the uterus during gestation, that causes the changes in the breasts incidental to pregnancy; and there is still less doubt that the secretion of milk after parturition is due to the irritation of the generative canal which obtains during and after labour. In women who menstruate during lactation, each menstrual period is accompanied by an increase, or "renewal", of the milk, as it is popularly called.

The sympathy, or synergy, between the stomach and the breasts is also very marked. After parturition, eating or drinking produces an immediate sensation in the breasts, which accompanies the after pains. Long after labour, and, indeed, during the whole of lactation, the "draught" in the breast is immediately produced by swallowing cold or hot drinks. This does not depend merely upon the passing of the fluid into the circulation, and its excretion by the *mammæ*. The sensation of the draught in the breasts follows too immediately upon the injection of food or drinks into the stomach, to admit of such a supposition; nor does the intensity of the sensation of the draught depend upon the quantity of drink taken, which it would necessarily do, if the circulation were the channel by which the stomach excited the breasts. It depends, on the contrary, either upon the intensity of the impression made upon the gastric nerves,—a wine-glass of hot drink, or a small quantity of ice, exciting the breast more than a hearty meal of food or drink at the ordinary temperature.

What is called the "draught", consists of two elements,—the sensation and the secretion. The sensation is a purely nervous phenomenon, and always precedes the secretion.

Another mode in which the breasts are excited to secrete, is through the influence of emotion. During the establishment of the secretion of milk after labour, the sight of the child excites the sensation of the "draught"; and during lactation, when the mother is absent from her child, the mere recollection of the infant is sufficient, in many cases, to produce it.

Mechanical irritation of the nipple is another mode of producing and increasing the flow of milk. Cases are on record in which even childless women have, by allowing the suction of an infant, had a secretion of milk established.

Does the *Bofaireira* act according to a new principle? Has it a specific influence upon the mammary gland; or does it merely act by irritating the gland, as any other irritant would do? I believe it must be granted, that this plant has a specific galactagogue action; for it is upon irritating treatment and friction, that we depend for a diminution of the

flow of milk, when excessive, after parturition, or in weaning, at the end of lactation.

The leaves of the euphorbiaceæ all contain an acid principle. The leaves of Bofareira evidently contain castor-oil. The leaves are greasy upon the surface, and the taste of castor-oil is perceptible; but there is besides this an acid taste in the infusion of the leaves, probably depending on some essential oil. The infusion is not unlike senna in taste and smell:

Since the foregoing cases occurred, I have used the remedy in a case of scanty menstruation of a remarkable kind. Owing to exposure to marsh malaria, some years ago, the patient had scarcely a sign of coloured discharge at the usual catamenial periods. She used the infusion of the leaves of the red Bofareira at the date of her period, applying the infusion and leaves to the breasts, and the vapour to the genitals, with the effect of producing, in two days, considerable flow of the catamenia. From the effects in this case, and in one of the cases already related, the Bofareira promises to be of considerable value as a direct emenagogue; at all events the cases in which I have tried it, show that the plant does not lose its efficacy in this climate. I hope that, in America and other parts in which the plant is common, perennial instead of annual, extensive trials of its efficacy both as an emenagogue and a galactagogue, will be made.

7, Bolton Street, September 1850.