SPHAGNUM MOSS FOR USE AS A SURGICAL DRESSING; ITS COLLECTION, PREPARATION AND OTHER DETAILS

AN ILLUSTRATED DEMONSTRATION

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THE September number of the well-known and justly popular London *Graphic* bore in conspicuous capitals on its front cover the question—"Are you collecting Sphagnum Moss?—see page 281," and thus brought before its large circle of Canadian readers what was to most of them a new word and a novel war activity

Scholars of Greek of course knew what Sphagnum used to mean, and botanists recognized the word as the generic name of the peat mosses, but even these learned people were probably surprised and somewhat incredulous when they read that "the collecting, drying and making into surgical dressings of sphagnum moss has become a national industry in Scotland"—that "the work is being extended all over Ireland, England and Wales," and that the Government through Sir Edward Ward, D.G.V.O., had established central depots all over Great Britain to receive and forward the material to the war hospitals which were "profoundly thankful for a dressing which is better than absorbent cotton."

Although I have introduced my subject by this quotation from the *Graphic* I do not labour under the delusion that that excellent paper is a standard work on Surgery, neither do I lack more weighty authority; I quote it simply because no previous publication had stated the case in so striking a way or to so large an audience. As a matter of fact sphagnum dressings made their appearance in the British press at least two years ago and since then have been much written about, but here in Canada at least, very few people seem to have heard of them and the majority of our medical men have been too intent on other matters to pay much attention to the

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occasional sphagnum articles in the *British Medical Journal*, *The Lancet* and other similar publications.

In spite of our incredulity or indifference the *Graphic* statement is apparently within the truth, and what is more to the point, not only are voluntary aid workers by the thousand collecting, and preparing, sphagnum, but after due experiment the War Office has formally approved of the dressings; the Red Cross has followed suit, and last, but not least so far as we are concerned, the Canadian Red Cross Commissioner in London has requisitioned a monthly supply of some thousands of dressings of Canadian sphagnum for the Canadian hospitals in the Shorncliffe and London areas.

Sphagnum is the basic plant of the peat deposits which for many years I have been studying in connexion with a research for the Canadian Government on the fuel resources of Canada. Thus when certain of my friends, including the late Sir Lauder Brunton, wrote last winter of the attempt that was being made to introduce sphagnum for surgical dressing purposes, it occurred to me that here was a chance for one who was too old to fight still to be of some use, and therefore I obtained through my correspondents specimens of "surgical" moss, and after learning all I could about the matter I set to work to search the different bogs in this country for suitable material. Even in the spring of 1916 the use of moss in the hospitals was still in the experimental stage and I had great difficulty in getting my specimens passed upon by the authorities. Ultimately, however, they reported on the samples, accepting some lots and rejecting others, and thus I found that in certain parts of Canada we had excellent surgical sphagnum. I then collected a few hundred bushels of the best moss available and persuaded the local Red Cross organization in Guysborough—the town nearest my country home in Nova Scotia, to prepare a large number of dressings to War Office specification, and a lot of these dressings was sent over to be tested in actual service.*

The work above outlined was of course private and altogether unofficial, but after proceeding thus far we turned the matter over to the Quebec Provincial Red Cross and they, with the help of certain affiliated organizations, are now making the dressings and arranging to send forward a regular monthly supply to the Canadian hospitals in England.

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*At the time of Dr. Porter's address no report had been received regarding this sample lot of dressings, but since then formal notification has been received that "they are of exceptionally good quality and of very high absorbency."

Sphagnum is the Greek word for moss, but at present is restricted by botanists to a single genus of about forty species and varieties all of which are found in sub-Arctic and cold temperate zones. They are at their best in Newfoundland, Labrador and other northern districts, but they also grow freely in central and eastern Canada and other similar districts on the European continent. The decayed or semi-decayed sphagnum accumulated in the bottom of bogs is the fundamental material of peat, and the living plants themselves are largely used in Europe, and particularly in Germany, for cattle bedding, packing material, and various industrial purposes.

The softer and finer qualities of sphagnum have been used since time immemorial in what might be called home-made surgery, and moss dressings are said to have been employed to a limited extent in the Napoleonic and Franco-Prussian wars; but since then little has been heard of them until after the present war began. We now know, however, that the German army medical people were using them before the war and that they are using them in large quantities at the present time.

The British use of sphagnum in army surgical work proper has, I believe, developed altogether within the last eighteen months. Dressings made by Cathcart in Edinburgh were apparently the first to be used, but I have no exact information as to dates and quantities. Dressings were apparently first furnished to the War Office last autumn, but even up to the middle of April of this year the supplies were relatively small. The Irish St. John's Ambulance Association, under the presidency of the Countess of Waterford, followed the Edinburgh society closely and created a sphagnum department in October or November, but this organization was only producing 5,000 dressings in April, whereas now it is supplying about 35,000 per month. Similar societies have grown up in England and Wales, and the total output of dressings had reached a very large figure even before the War Office and the Red Cross formally adopted them in the latter part of the summer. To show how rapidly the demand has grown I might refer to an article by Sir Alexander Ogston in the *National Review* for August. He estimates the probable number of casualties for the coming year, discusses the vast quantity of surgical supplies which will be required by the several belligerent nations, and concludes that within the next twelve months at least fifty million dressings should be prepared for the use of the various war hospitals. He makes it clear that he considers sphagnum superior to any other available absorbent dressing.

Whether his huge estimate is right or wrong it is clear that the demand will be so enormous that Canada with its large sphagnum resources, and its supply of willing Red Cross workers, should lose no time in getting to work.

Only two or three of our numerous species of sphagnum have proved suitable for surgical use, and of these one—S. papillosum, found thus far only in the Maritime Provinces, is far superior to all others. Some specimens of this plant show an astonishing absorbency and dressings made of the best dry moss will absorb twenty to twenty-two times their own weight in water before they begin to drip. Average moss will go as high as twelve at least, whereas absorbent cotton does not go above half even of this last figure. Another advantage of sphagnum is that it holds the absorbed liquid far better than cotton and does not get foul nearly so quickly, these valuable qualities being no doubt due to the fact that in sphagnum the liquid is taken into large cells with elastic walls instead of being merely held by capillarity between the fibres as in cotton. These exceptional absorbent powers are as true of pus and other liquid discharges as of water, and hospitals using moss find that their dressings do not require renewal nearly as frequently as ordinary gauze and cotton. Further the moss dressings are much lighter and less heating, and a great many observers call attention to these features as conducing greatly to the comfort of patients.

"I feel assured that sphagnum is *the* dressing for the Carrel Tube system. It is so light and absorbent."

Extract from a letter from Colonel Caird, Professor of Clinical Surgery in Edinburgh, now on duty in France.

"Sphagnum dressings require only a thin layer of gauze over the wound, or not even that if gauze is scare, as the gauze bag which contains the moss is practically sufficient. For all freely discharging wounds sphagnum dressings are much superior to cotton; for wounds with slight discharges either would serve the purpose."

Extract from a letter from the chief surgeon of a large British war hospital.

"Even the best prepared cotton, although in a sense very absorbent, lacks the power to retain discharges which is possessed by sphagnum moss. Thus whereas a pad of absorbent cotton allows these sanious discharges to penetrate and pass beyond to the bed clothes through a very limited portion of the dressing, or causes them, when thick, and purulent, to lie between its clogged surface and the wound, a pad of sphagnum absorbs and holds up the discharges until it becomes fully saturated.

"In civil hospitals in times of peace the deficiencies of cotton are not so much noticed. The majority of the wounds are those made by the surgeons themselves under ideal conditions and thanks to antiseptic surgery these wounds have only a slight discharge if any at all. Hence the fallacy of supposing that a dressing which meets requirements in a time of peace must be equally useful under all circumstances, including those of war."

Extract from a paper by C. W. Cathcart, senior surgeon Edinburgh Infirmary, June 16th, 1916.

The writer has been informed recently by one of the nurses at the Eastbourne Naval Hospital that sphagnum dressings were found very satisfactory, and were greatly preferred by the patients as they were less heating than cotton and therefore far more comfortable. They were also found particularly useful in cases of bad burns. The same informant said that splint pads made of second quality sphagnum were greatly preferred to cotton for fractures, as they retained their elasticity and were cool and very light.

Owing to the great variations in usefulness of different kinds of sphagnum, the material has to be collected by people who have been trained to know the good from the bad, and as the different species of sphagnum grow very much intermixed the collector will often have difficulty at first in deciding just what to take and what to leave. The method of collection is to wade out into the bog, grasp and pull up the upper layers of the moss by the handful, wring them out, put them in sacks and take them to the edge of the bog whence they are carted to some suitable place where they can be spread out to dry and have the rubbish picked out. The rough dried moss is then shippped to Red Cross work rooms where it is very carefully picked over and classified into three or more qualities. All the best stuff is put into muslin cases for dressings, the intermediate is made up into pillows, splint pads, dysentry pads, etc., the worst discarded. One has to be extremely careful about the first collecting, as the picking over of poor moss requires an enormous amount of labour and time, and produces very little material in the end. Throughout the work all possible precautions are taken to keep the moss clean and free from infection, but the general opinion seems to be not to attempt to sterilize the dressings here, but to leave that business to the hospitals. In the earlier months of the work Dr. Cathcart sterilized a considerable number of his dressings, about a fifth of his material, and the Irish Bureau about a tenth, the rest going forward unsterilized. Now I am informed that all of the British hospitals at least do their own sterilizing which is far more satisfactory.

In closing I may say that although this surgical use of sphagnum is extremely new, except in Germany, and is still to a certain extent experimental, yet already there are thousands of volunteer workers engaged on the preparation of dressings in Great Britain, and the two or three score of Canadians now interested can easily be multiplied by a hundred, if necessary, in the spring. There is no doubt that the material is greatly needed, and it is popularly understood that the supplies in Great Britain are insufficient to meet the

demand. Official information as to this latter point is, however, being sought, and if the reply is such as we anticipate it is hoped that Canadians, particularly in the Maritime Provinces, will interest themselves heartily in the work.

The literature of sphagnum is far from voluminous if we except the popular, but irresponsible, statements which have appeared in the Scotch and English newspapers during the last year. Certain of the technical articles are, however, definite and satisfactory.

1. The first mention of sphagnum in connexion with modern surgery seems to have been in 1882 when Neuber and others published a series of articles in German beginning with an important paper in *Arch. für Klin. Chir.* Bd. 27, S. 757. These articles interested a number of British surgeons, but so far as I can learn were not re-published or even abstracted in English until after the war began when Professors Balfour and Cathcart published a translation with comments and recommendations:

2. "Bog Moss for Surgical Dressings," *The Scotsman*, November 17th, 1914.

3. The Neuber article was again reviewed in an excellent paper by Cathcart: "Cheap Absorbent Dressings for the Wounded," *British Medical Journal*, July 24th, 1915, pp. 137-8-9.

4. The question of the sterilization of sphagnum dressings is taken up by Cathcart in "Methods of Preparing Sphagnum Moss as a Surgical Dressing," *The Lancet*, April 15th, 1916, p. 820.

5. The general sphagnum situation is discussed at length in an important article by Sir Alexander Ogston: "Our Wounded—Sphagnum Moss as a Dressing," *National Review*, August, 1916.

There are numerous other references to the subject in the medical press, but so far as I know none of them are of any considerable technical importance. The following may, however, be mentioned:

6. *The Lancet*, October 16th, 1915, p. 898.
7. *The Lancet*, December 11th, 1915, p. 1316.
8. *British Medical Journal*, December 25th, 1915, p. 942.
9. *The Scotsman*, June 16th, 1916.
10. *British Medical Journal*, August 12th, 1916.

Supplementary Note by the Author

Since the above address was given the situation has developed considerably. Favourable reports on sphagnum dressings have been made by the commanding officers of several Canadian war

hospitals, and definite requisitions for very large quantities of dressings have been received from the Director of Medical Services Canadian, in England, and from No. 3 Hospital in Boulogne, etc. On the other hand we are officially informed that the facilities for producing dressings in Great Britain and Ireland have so increased that Canadian supplies are not immediately required, although they probably will be greatly needed when the spring campaign begins. Finally the present submarine situation is such that there is some question as to whether it will be advisable further to burden our already overtaxed shipping with relatively bulky consignments of dressings.

The central executive of the Canadian Red Cross is dealing with the situation in a very practical way. A special Sphagnum Committee has been appointed to look into the whole matter. Standard specifications for collecting and preparing moss are being drawn up, an inspection department is being organized and the Provincial Red Cross Societies in Eastern Canada and particularly in Nova Scotia are much interested and will undoubtedly take full charge of the work of making dressings. By the time the snow melts and our bogs again become accessible, arrangements will have been completed for the production of whatever quantity of dressings may be required, and in this connexion it must be realized that even if transportation difficulties render it inadvisable to send large supplies overseas, the work now being done will not be wasted, as sphagnum dressings have proved to be so useful and so much cheaper than gauze and cotton that a considerable demand will unquestionably grow up in our own hospitals.

In conclusion it should be stated that while the Canadian Red Cross is thus undertaking serious and probably extensive work on this new material, it considers it very inadvisable for untrained persons to make up dressings. Experience in Great Britain has shewn that only certain grades of moss are useful and dressings made to any but the strictest specifications are likely to be worse than useless. It is desirable that all accessible bogs in Canada should be searched for suitable moss, and specimens sent to the Secretary of the Sphagnum Committee at McGill University will be examined and reported on without delay, but no attempt should be made to collect moss in quantity, still less to make dressings, except with the approval and subject to the inspection of the Provincial Red Cross authorities.