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Introduction to the symposium on the beech forests of Europe.

By *Eduard Rübel*, Zürich.

At a meeting in August 1923 the I. P. E. carried a resolution proposed by Prof. Szafer, to work on the unification of phytosociological research methods and to begin by a treatment of beech forests in the several countries from uniform points of view. I was appointed to compose the propositions of investigation. These were adopted by the Permanent Commission of the I. P. E. and by a number of participants in beech forest research, and printed in 1925¹⁾.

It is a very good plan of Prof. Tansley's to arrange now, seven years after the vote on cooperation in beech forest research, a symposium on the beech forests of Europe. The international ad interim Committee for the phytogeographical section of the international botanical congress approved of it unanimously.

Prof. Tansley has still further advanced the interest of our topic. He invited us for a special beech excursion through the English beech woods where we had an excellent opportunity of seeing the extreme northwestern facies of European beech woods and of discussing this facies in comparison with those of our respective countries.

«In order to achieve» in to days symposium «as much uniformity of treatment as possible and thus to facilitate the building up of a trustworthy composite picture of the European Beech Forests» Tansley drew up a list of questions which each speaker should consider.

Each contributor will define the area he is dealing with within the beech forest region which we know to have its limits roughly running through England, Sweden, from East Prussia to the Black Sea, through the Mediterranean Islands.

¹⁾ Vorschläge zur Untersuchung von Buchenwäldern. Von Eduard Rübel, im Auftrage der Permanenten Kommission der I. P. E. Beiblatt Nr. 3 zu den Veröffentlichungen des Geobotanischen Institutes Rübel in Zürich. 1925.

Each will give the range of the climatic factors. We know the climate to be oceanic to medium, the difference of the mean temperature between the coldest and hottest month to be 15—25° C, the coldest month being around 0° or somewhat below 0°. The rainfall optimum is about 1000 mm with a mean annual temperature of 10° C, and correspondingly higher or lower with other temperature coefficients.

The altitudinal limits will be given, having regard to exposure and slope. In northern Europe we only find an upper altitudinal limit as the beech is there a tree of the plain. Towards the South the beech forests lie higher up even forming the upper tree limit. Below the beech forest lies the belt of *Castanea sativa* (chestnut) and *Quercus pubescens* forests.

Then we expect the soil factors to be treated. In markedly oceanic England the beech only forms woods on the chalk or other porous soils, which counteract the excessive climatic moisture. In the optimum of occurrence it is indifferent. We shall hear about the variations of these soil exigencies in correspondence with the diverse climates.

Of primary importance in the biotic factors will be especially the effect of man, e. g. forestry. We must know the origin beginning with the available data relating to the past history of the forests described; then the regeneration: it may be by artificial sowing, by planting, by sprouts (Stockausschlag, reproduction par rejets, cépée) or by natural sowing (Naturbesamung, ensemencement naturel). Then comes the kind of management: if as high forest (Hochwaldbetrieb), or as coppice (Niederwald) or coppice with standards (Mittelwald), as well as the form, e. g. if clear felling (Kahlschlag), if group cut (Femelschlag) or selective felling (Plenterform), the last maintaining the forest in a form nearest to virgin forests. We shall learn about the consistence or density of canopy (Bestandesschluss), and the age of the stock (Bestandesalter, Age du peuplement).

The country's laws are also relevant e. g. to know whether grazing in the forest was or is allowed and what kind of grazing occurs (by sheep, goats, cattle or only by deer) and with what intensity.

Besides all these factors we shall hear about the floristic and ecologic composition of the forest. The plant lists of all the layers

is necessary with their dominances, frequencies and the constancies as well as their uniformity and diversity, further the ecologic relations of the exclusiveness of species in beech forests, life form, rhythm, periodicity and aspects etc.

With regard to the local climate light intensity conditions beneath the shade of the tree layer, local air moisture conditions etc., are of interest.

Succession will be considered, past and future, that is on the one hand the development of beech forest from other types of vegetation, say very often from alder forests (*Alnus*), and so on; on the other hand changes in which other types of vegetation may try to supersede the beech forest. Beech forest being known to be the climax in a large region, other types will probably only play a role in superseding the beech forest on the fringes of its occurrence.

The summation of all the knowledge brought together by the contributors will we hope present a good picture of the beech forest as a community, especially of the different parts into which we must divide this large and diversified community, that is the several associations and facies. A great difficulty in classifying the different beech communities described will be that the differentiation proceeds in two directions, namely regionally and ecologically. The forestforming beech tolerates a wide range of conditions, it is eurecic (euryözisch). It is unaffected by minor changes in climate as well as in soil and biotic management, though such factors will change other parts of the floristic composition, thus changing the minor units of communities.

The one direction of differentiation is easy to study. From one country to the other, from one region to the other, we know that the general flora changes. We leave the area of one species and pass into the area of another. Some of the changing species of a region are included in the list of beech forest species. We thus find a number of regional floristic facies all over Europe. Are they to be called associations or facies of an association? The old question: how many species may change without our speaking of a new association, or how many must change that we may speak of a new association!

Much more difficult to coordinate is the ecologically conditioned change of the list of species. For this the beech forest community must be thoroughly investigated sociologically.

In Switzerland we find in good medium situations a dominance by *Anemone nemorosa* or by *Asperula odorata* in the undergrowth. Where it is moister the vegetation changes into one dominated by *Allium ursinum*. Conspicuous is an association in the moist oceanic Prealpes with abundant *Acer pseudoplatanus*, *Acer campestre*, *Acer platanoides*, *Tilia platyphyllos*. Are these communities such as *Acereto-Fagetum*, *Allieto ursini-Fagetum*, *Anemoneto nemorosae-Fagetum* only local modifications or are they good associations carrying us a longer way? We shall probably obtain for every country quite a list of more or less well defined associations within the big beech forest community. Then comes the difficult task of comparing, of linking them together, because surely many of them will be synonymous. But for finding out which really are synonymous the single ones must be very accurately described and defined. Especially we must have an accurate list of the combination of the important species, those which have a constancy, or an exclusiveness value, and which differentiate nearly related communities, as well as species of constructional value (Bauwert, comportement dynamogénétique).

The recorder or the secretary of our section will doubtless be pleased to obtain every country's list of literature, on beech vegetation, especially studies carried out under the new scheme since the first steps of the I. P. E. here taken in order to form from these one coherent, sufficient and exhaustive list of beech forest literature as an appendix to the proceedings of this symposium.
