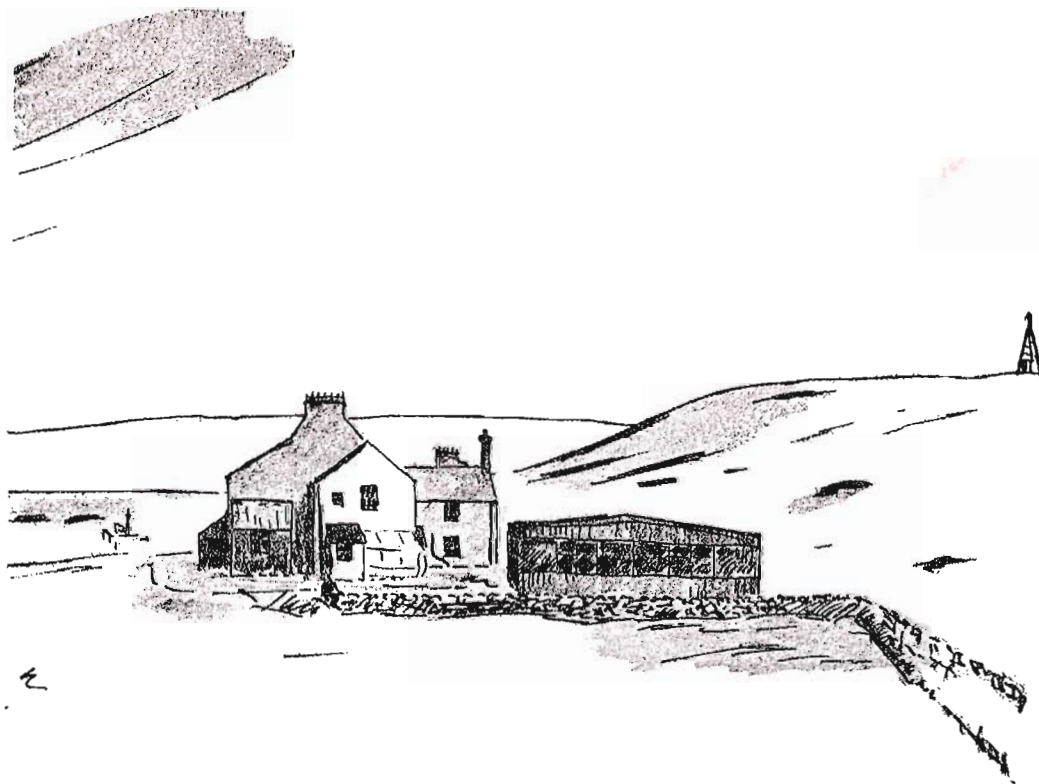


*Ken*

# Aspects of the Ecology of The Northern Pennines

## Occasional Papers

No. 2



**MOOR HOUSE**

## ASPECTS OF THE ECOLOGY OF THE NORTHERN PENNINES

### 2. MOOR HOUSE PUBLICATION LIST

MOOR HOUSE FIELD STATION, Garrigill, Alston, Cumbria.

This is an author list of publications by members of staff, by research workers from Nature Conservancy Research Stations (prior to the re-organisation of 1973) particularly Merlewood, and by research students and others from universities and research organisations, who have worked on the Reserve and used the Field Station's facilities.

The list is arranged alphabetically, based on the first named author only. Papers are grouped into nine broad subjects categories (see below), which in turn are divided into those that originate from work done wholly, or at least primarily, at Moor House, or those where the research has only partly been done on the Reserve. A third section includes 10 references of work done before 1952, when the Nature Conservancy purchased the property.

Within this grouping, especially in the second class, there are a number of border line cases, but the list is likely in any case to be incomplete. The use of data derived from research at Moor House is widespread in ecological journals. It is impossible to include these references here, although, especially when comparisons are made, they are of research interest.

The arrangement of the list:

#### Subject categories

BOTANY - systematics, distribution

BOTANY - production

CLIMATE, HYDROLOGY

CONSERVATION, MANAGEMENT, ECOSYSTEM RESEARCH

FORESTRY

GEOGRAPHY, GEOLOGY, SOILS (physical & chemical)

MICROBIOLOGY, DECOMPOSITION

ZOOLOGY - vertebrates, amphibians

ZOOLOGY - invertebrates

Origin

Class A publications of data derived from Moor House research

Class B publications in which only part of the research was done at Moor House

Class C publications of work prior to 1952

Type

I books and papers published

II degree theses

III occasional papers

Each year in the autumn, an Annual Report has been produced. Meteorological data from the Climatological Station was published monthly and summarised annually by the Meteorological Office, but since May 1980 fewer records have been taken. Records are held at Merlewood Research Station for consultation.

Biological type specimens, herbaria and invertebrate collections, are maintained, and a photographic and site use index kept. Small projects are written up in the volumes of the Reserve Record, copies of which are at Merlewood Research Station and Blackwell, Bowness (N.C.C. North West Region Offices).

M. Rawes

BOTANY - systematics and distribution

Class A

Type I

- CHAMBERS, C. 1978. A radio carbon dated pollen diagram from Valley Bog, on the Moor House National Nature Reserve. *New Phytol.*, 80, 276-280.
- EDDY, A. & WELCH, D. 1967. A species-list of flowering plants and ferns for the Moor House National Nature Reserve in Upper Teesdale. *Proc. Bot. Soc. Br. Isl.*, 325-336.
- EDDY, A., WELCH, D. & RAWES, M. 1969. The vegetation of the Moor House National Nature Reserve in the northern Pennines, England. *Vegetatio*, 16, 239-284.
- EDDY, A. 1973. A new vice-county record - Thuidium abietinum. *J. Bryol.*, 7, 513.
- RATCLIFFE, D.A. & EDDY, A. 1960. Alopecurus alpinus Sm. in Britain. *Proc. Bot. Soc. Br. Isl.*, 3, 389-391.
- SWINSCOW, T.D.V. 1958. An Arctic-Alpine lichen new to England. *Lichenologist*, 1, 29-30.
- WELCH, D. 1966. Biological Flora of the British Isles: Juncus squarrosus L. *J. Ecol.*, 54, 535-548.
- WELCH, D. 1967. Studies in the germination and establishment of Juncus squarrosus. *New Phytol.*, 66, 89-98.
- WELCH, D. 1967. Communities containing Juncus squarrosus in Upper Teesdale, England. *Vegetatio*, 14, 229-240.
- WELCH, D. & RAWES, M. 1967. An erroneous naming of a Callunetum in the northern Pennines. *Field Naturalist*, 12, 25-26.
- WELCH, D. & EDDY, A. 1969. Bryophyte species list for the Moor House National Nature Reserve in Upper Teesdale. *Trans. Northumb. Durham & Newtle. Nat. Hist. Soc.*, 17, 47-56.

Type II

COLLISON, J.H. 1979. Ecological adaptations of Trifolium repens L. to the upland environment. B.Sc. Dissertation, Dept. of Agricultural Biology, University of Newcastle-upon-Tyne.

WELCH, D. 1964. Studies in the autecology of Juncus squarrosus. M.Sc. Thesis, University of Durham.

Type III

RAWES, M. 1975. The botany of Moor House. In: Aspects of the Ecology of the Northern Pennines. Moor House Occasional Paper No. 8.

RAWES, M. 1981. Botanical species lists for Moor House National Nature Reserve. In: Aspects of the Ecology of the Northern Pennines. Moor House Occasional Paper No. 12.

Class B

Type I

BARLING, D.M. 1962. Studies on the biology of Poa subcaerulea Sm. *Watsonia*, 5, 163-171.

BELL, P.R. & LODGE, E. 1963. The reliability of Cratoneuron commutatum (Hedw.) Roth, as an 'indicator moss'. *J. Ecol.*, 51, 113-122.

BRADSHAW, M.E. 1962. The distribution and status of species of Alchemilla vulgaris L. aggregate in Upper Teesdale. *J. Ecol.*, 50, 681-706.

BRADSHAW, M.E. 1963. Studies on Alchemilla filicaulis Bus., sensu lato and A. minima Walters. Introduction, and I. morphological variation in A. filicaulis sensu lato. *Watsonia*, 5, 304-320.

BRADSHAW, M.E. 1963. Studies on Alchemilla filicaulis Bus., sensu lato, and A. minima Walters. II. Cytology of A. filicaulis sensu lato. *Watsonia*, 5, 321-326.

BRADSHAW, M.E. 1964. Studies on Alchemilla filicaulis Bus., sensu lato and A. minima Walters. III. Alchemilla minima. *Watsonia*, 6, 76-81.

COPPINS, B.J. & GILBERT, O.L. 1981. Field meeting near Penrith, Cumbria. *Lichenologist*, 13, 191-199.

- ELKINGTON, T.T. 1964. Biological Flora of the British Isles: Myosotis alpestris F.W. Schmidt. J. Ecol., 52, 709-722.
- GRANT, S.A. & HUNTER, R.F. 1962. Ecotypic differentiation of Calluna vulgaris (L.) in relation to altitude. New Phytol., 61, 44-55.
- HARVEY, M.J. 1966. An experiment with Epilobium angustifolium. Proc. B.S.B.I., 6, 229-231.
- HOLMES, N.T.H. 1976. The distribution and ecology of Grimmia agassizii (Sull. and Lesq.), Jacq., in Teesdale. J. Bryol., 9, 275-278.
- PETTET, A. 1964. Studies on British Pansies. I. Chromosome numbers and pollen assemblages. Watsonia, 6, 39-50.
- PETTET, A. 1964. Studies on British Pansies. II. The status of some intermediates between Viola tricolor L. and V. arvensis Murr. Watsonia, 6, 51-69.
- RAVEN, P.H. & MOORE, D.M. 1964. Chromosome numbers of Epilobium in Britain. Watsonia, 6, 36-38.
- TAYLOR, K. 1971. Biological Flora of the British Isles: Rubus chamaemorus L. J. Ecol., 59, 293-306.
- TURNER, J. & HODGSON, J. 1979. Studies in the vegetational history of the northern Pennines. 1. Variations in the composition of the early Flandrian Forests. J. Ecol., 67, 629-646.
- WEIN, R.W. 1973. Biological Flora of the British Isles: Eriophorum vaginatum L. J. Ecol., 61, 601-615.
- WELCH, D. 1967. Notes on Myosotis scorpioides agg. Watsonia, 6, 276-279.

Type II

- ELKINGTON, T.T. 1962. Experimental taxonomy of some members of the Teesdale Flora. Ph.D. Thesis, University of Durham.
- FEARN, G.M. 1971. Biosystematic studies of selected species in the Teesdale Flora. Ph.D. Thesis, University of Sheffield.

BOTANY - production

Class A

Type I

- CLYMO, R.S. & REDDAWAY, E.J.F. 1971. Productivity of Sphagnum (Bog Moss) and peat accumulation. Hidrobiologia, 12, 181-192.
- CLYMO, R.S. 1973. The growth of Sphagnum: some effects of environment. J. Ecol., 61, 849-869.
- CLYMO, R.S. & REDDAWAY, E.J.F. 1974. Growth rate of Sphagnum rubellum Wils. on Pennine blanket bog. J. Ecol., 62, 191-196.
- CLYMO, R.S. 1978. A model of peat bog growth. Production - Ecology of British Moors and Montane Grasslands (Ed. by O.W. Heal and D.F. Perkins) pp. 187-223. Springer-Verlag, Berlin.
- FORREST, G.I. 1971. Structure and production of North Pennine blanket bog vegetation. J. Ecol., 59, 453-480.
- FORREST, G.I. & SMITH, R.A.H. 1975. The productivity of blanket bog vegetation types in the northern Pennines. J. Ecol., 63, 173-202.
- GORE, A.J.P. 1961. Factors limiting plant growth on high-level blanket peat. I. Calcium and Phosphate. J. Ecol., 49, 399-402.
- GORE, A.J.P. 1961. Factors limiting plant growth on high-level blanket peat. II. Nitrogen and Phosphate in the first year of growth. J. Ecol., 49, 605-616.
- GORE, A.J.P. 1963. Factors limiting plant growth on high-level blanket peat. III. An analysis of growth of Molinia caerulea (L.) Moench. in the second year. J. Ecol., 51, 481-491.
- GORE, A.J.P. & URQUHART, C. 1966. The effects of waterlogging on the growth of Molinia caerulea and Eriophorum vaginatum. J. Ecol., 54, 617-633.
- GORE, A.J.P. 1975. An experimental modification of upland peat vegetation. J. appl. Ecol., 12, 349-366.
- GRACE, J. & WOOLHOUSE, H.W. 1970. A physiological and mathematical study of the growth and productivity of a Calluna-Sphagnum community. I. Net photosynthesis of Calluna vulgaris L. Hull. J. appl. Ecol., 7, 363-381.

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- GRACE, J. 1973. An apparatus for the study of leaf canopy optics. J. appl. Ecol., 10, 57-62.
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- GRACE, J. & MARKS, T.C. 1978. Physiological aspects of bog production at Moor House. Production - Ecology of British Moors and Montane Grasslands (Ed. by O.W. Heal and D.F. Perkins) pp. 38-51. Springer-Verlag, Berlin.
- HOPKINS, B. 1955. The species-rich relations of plant communities. J. Ecol., 43, 409-426.
- JONES, H.E., FORREST, G.I. & GORE, A.J.P. 1971. First stage of a model for the growth and decay of Calluna vulgaris at Moor House. In: Tundra Biome working Meeting on analysis of Ecosystems, Kevo, Finland. (ed. O.W. Heal), 133-160.
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- MARKS, T.C. & TAYLOR, K. 1972. The mineral nutrient status of Rubus chamaemorus L. in relation to burning and sheep grazing. J. appl. Ecol., 9, 501-511.
- PARK, K.J.F., RAWES, M. & ALLEN, S.E. 1962. Grassland studies on the Moor House National Nature Reserve. J. Ecol., 50, 53-62.
- RAWES, M. 1961. The problem of Nardus and its productivity in relation to sheep grazing at Moor House, Westmorland. J. Br. Grassld. Soc., 16, 190-193.
- RAWES, M. 1963. The productivity of a Festuca-Agrostis alluvial grassland at 1,700 ft. in the northern Pennines. J. Br. Grassld. Soc., 18, 300-309.



ROTHERY, P. 1974. The number of pins in a point quadrat frame. J. appl. Ecol., 11, 745-754.

WELCH, D. & RAWES, M. 1964. Herbage production of some Pennine grasslands. Oikos, 16, 39-47.

WELCH, D. 1966. The reproductive capacity of Juncus squarrosus. New Phytol., 65, 77-86.

#### Type II

ASHMORE, M.R. 1975. The Eco-Physiology of Calluna vulgaris (L.) Hull in a moorland habitat. Ph.D. Thesis, University of Leeds.

GRACE, J. 1970. The growth-physiology of moorland plants in relation to their aerial environment. Ph.D. Thesis, University of Sheffield.

MARKS, T.C. 1974. The effects of moorland management on the growth of Rubus chamaemorus L. Ph.D. Thesis, University College London.

ROBERTSON, K.P. 1981. Eco-physiological studies of Eriophorum vaginatum L., in a moorland habitat. Ph.D. Thesis, University of Leeds.

#### Type III

CLYMO, R.S. & REDDAWAY, E.J.F. 1971. A tentative dry matter balance sheet for the wet blanket bog on Burnt Hill, Moor House National Nature Reserve. In: Aspects of the Ecology of the Northern Pennines. Moor House Occasional Paper No.3. 15 pp.

JONES, H.E. 1980. Experimental observations on competition in grasses. Merlewood Research and Development Paper, No. 79.

#### Class B

##### Type I

CLYMO, R.S. 1970. The growth of Sphagnum: methods of measurement. J. Ecol., 58, 13-49.

DAVY, A.J. 1980. Biological flora of the British Isles: Deschampsia caespitosa (L.) Beauv. (Aira caespitosa L., Deschampsia caespitosa (L.) Beauv.) J. Ecol. 68, 1075-1096.

- HAVILL, D.C., LEE, J.A. & STEWART, G.R. 1974. Nitrate utilisation by species from acidic and calcareous soils. *New Phytol.*, 73, 1221-1231.
- OLLERENSHAW, J.H., STEWART, W.S., GALLIMORE, J. & BAKER, R.H. 1976. Low temperature growth in grasses from northern latitudes. *J. agric. Sci.* 87, 237-239.
- OLLERENSHAW, J.H. & BAKER, R.H. 1981. Low temperature growth in a controlled environment of *Trifolium repens* plants from northern latitudes. *J. appl. Ecol.* 18, 229-239.
- WIEGOLASKI, F.E. 1972. Vegetation types and plant biomass in Tundra. *Arctic and Alpine Research*, 4, 291-305.

Type II

- URQUHART, C. 1969. The effects of waterlogging on the growth and mineral nutrition of some moorland plant species, with special reference to the soil redox potential. M.Sc. Thesis, University of Birmingham.

CLIMATE, HYDROLOGY

Class A

Type I

- CONWAY, V.M. & MILLAR, A. 1960. The hydrology of some small peat covered catchments in the northern Pennines. *J. Instn. Wat. Engrs.*, 14, 415-424.
- CRISP, D.T. & ROBSON, S. 1979. Some effects of discharge upon the transport of animals and peat in a north Pennine bedstream. *J. appl. Ecol.*, 16, 721-736.
- GORE, A.J.P. 1968. The supply of six elements by rain to an upland peat area. *J. Ecol.*, 56, 483-496.
- GORHAM, E. 1956. On the chemical composition of some waters from the Moor House National Nature Reserve. *J. Ecol.*, 44, 375-382.
- GREEN, F.H.W. 1953. A remarkable low humidity. *Weather*, 8, 182-184.
- MANLEY, G. 1980. The northern Pennines revisited: Moor House, 1932-78. *Meteorological Magazine*, 109, 281-292.

MILLAR, A. 1964. Notes on the climate near the upper forest limit in the northern Pennines. Q. Jl. For., 58, 239-246.

SMITH, K. 1971. Some features of snow-melt recession in the upper Tees basin. Water and Water Engineering, 345-346.

Type II

JAMIESON, D.G. 1967. The spatial and temporal distribution of storm rainfall. Ph.D. Thesis, University of Newcastle upon Tyne.

PAINTER, R.B. 1967. The formation of flood waves in natural channels. Ph.D. Thesis, University of Newcastle upon Tyne.

Type III

BAILEY, A.D. 1975. Solar radiation recordings at Moor House. Merlewood Research Station 'Research and Development Paper', No. 65.

Class B

Type I

ARCHER, D.R. 1982. Severe snowmelt run-off in North East England and its implications. J. Instn. Civil Eng.

ARCHER, D.R. 1982. The seasonality of flooding and the assessment of seasonal flood risk. J. Instn. Civil Eng.

BALDWIN, H. & SMITHSON, P.A. 1979. Wind chill in upland Britain. Weather, 36, 294-308.

BURT, S.D. 1980. Snowfall in Britain during winter 1978/79. Weather, 35, 288-301.

COLLINGE, V.K. & JAMIESON, D.G. 1968. The spatial distribution of storm rainfall. J. Hydrol., 6, 45-57.

CRISP, D.T. & LE CREN, E.D. 1970. The temperature of three different stony streams in north west England. Hydrobiologia, 35, 305-323.

CRISP, D.T. 1977. Some physical and chemical effects of the Cow Green (Upper Teesdale) impoundment. Freshwater Biology, 7, 109-120.

- GREEN, F.H.W. 1956. Basic research on mountain climates in Great Britain and their relation to ecology and land use. Proc. & Pap. 6th Tech. Meet. Int. Un. Conserv. Nat., Edinburgh.
- GREEN, F.H.W. 1959. Some observations of potential evaporation, 1955/1957. Q. Jl. R. met. Soc., 85, 152-158.
- GREEN, F.H.W. 1959. Four years' experience in attempting to standardize measurement of potential evapo-transpiration in the British Isles, and the ecological significance of the results. Met. Ass. Sci. Hydrol., 92-100.
- GREEN, F.H.W. 1965. The incidence of low relative humidity in the British Isles. Met. Mag., 94, 81-88.
- GREEN, F.H.W. & HARDING, R.J. 1979. The effects of altitude on soil temperature. Met. Mag., 108, 81-91.
- HARDING, R.J. 1979. A note on the effect of the Cow Green Reservoir on the local climate. Institute of Water Engineers and Scientists Journal, 33, 252-254.
- HARDING, R.J. 1979. Radiation in the British uplands. J. appl. Ecol., 16, 161-170.
- HARDING, R.J. 1979. Climatological data analysis using a five-day week. J. Meteorol., 4, 73-76.
- MANLEY, G. 1956. The climate at Malham Tarn. Annual Report, Field Studies Council, 1955-56, pp. 43-56.
- MANLEY, G. 1971. The mountain snows of Britain. Weather, 26, 192-200.
- MANLEY, G. 1973. Climate. In: The Lake District. Ed. by Pearsall, W.H. & Pennington, W. Collins, pp. 106-120.
- MANLEY, G. 1979. Temperature records on Fountains Fell, with some Pennine comparisons. Field Studies, 5, 85-92.
- PIGGOT, C.D. 1979. Climate and vegetation. In: Upper Teesdale, the Area and its Natural History. Ed. by Clapham, A.R. pp. 102-121. Collins, London.
- RICHARDSON, W.E. 1956. Temperature differences in the South Tyne Valley with special reference to the effects of air mass. Q. Jl. R. met. Soc., 82, 342-348.

WHITE, E.J. & LINDLEY, D.K. 1976. The reduction of climatological data for ecological purposes: a preliminary analysis. J. Environ. Mgmt., 4, 161-182.

WHITE, E.J. 1979. The prediction and selection of climatological data for ecological purposes in Great Britain. J. appl. Ecol., 16, 141-160.

Class C

Type I

GLASSPOOLE, J. 1953. Frequency of cloud at mountain summits. Met. Mag., 82, 156-157.

MANLEY, G. 1936. The climate of the northern Pennines: the coldest part of England. Q. Jl. R. met. Soc., 62, 103-115.

MANLEY, G. 1938. High-level records from the northern Pennines. Met. Mag., 73, 69-72.

MANLEY, G. 1939. On the occurrence of snow cover in Great Britain. Q. Jl. R. met. Soc., 65, 2-27.

MANLEY, G. 1942. Meteorological observations on Dun Fell. Q. Jl. R. met. Soc., 68, 151-165.

MANLEY, G. 1943. Further climatological averages for the northern Pennines. Q. Jl. R. met. Soc., 69, 251-261.

MANLEY, G. 1946. The helm wind of Cross Fell 1937-1939. Q. Jl. R. met. Soc., 71, 197-219.

CONSERVATION, MANAGEMENT, ECOSYSTEM RESEARCH

Class A

Type I

ALLEN, S.E. 1964. Chemical aspects of heather burning. J. appl. Ecol., 1, 347-367.

CONWAY, V.M. 1955. The Moor House National Nature Reserve, Westmorland. Handbook of the Society for the Promotion of Nature Reserves, 1-7.

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- GORE, A.J.P. 1971. A field experiment, a small computer and model simulation. In: Mathematical Models in Ecology, 12th Symp. Brit. Ecol. Soc. (Ed. J.N.R. Jeffers), 309-325.
- GORE, A.J.P. & GODFREY, M. 1981. Reclamation of eroded peat in the Pennines. J. Ecol., 69, 85-96.
- HEAL, O.W. 1972. A brief review of progress in the studies at Moor House (U.K.). In: Proc. IV Int. Meeting on the Biological Productivity of Tundra, Leningrad. (Ed. F.E. Wiegolaski & T. Rosswall). 295-305.
- HEAL, O.W., JONES, H.E. & WHITTAKER, J.B. 1975. Moor House, U.K. In: Structure and Function of Tundra Ecosystems. Ecol. Bull. (Stockholm), 20, 295-320.
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- NEWBOULD, P.J. 1966. Studies at Moor House Field Station, Cumberland. B.B.C. Publication. *Land and People: The Countryside for use and leisure*.
- RAWES, M. & WELCH, D. 1964. Studies on sheep grazing in the northern Pennines. *J. Br. Grassld. Soc.*, 19, 403-411.
- RAWES, M. 1965. Residual effect of a manurial treatment in the northern Pennines. *Scot. Agric.*, 45, 39-41.
- RAWES, M. 1966. Productivity of upland grazings. *Proc. N. Engl. Soils Discussion Group*, 2, 34-40.
- RAWES, M. & WELCH, D. 1966. Further studies on sheep grazing in the northern Pennines. *J. Br. Grassld. Soc.*, 21, 56-61.
- RAWES, M. 1968. Sheep as an ecological factor. *Chimaera, J. Biol. Soc.*, Sheffield University, Spring 1968, 7-10.
- RAWES, M. & WELCH, D. 1969. Upland productivity of vegetation and sheep at Moor House National Nature Reserve, Westmorland, England. *Oikos*, Sup II, 72 pp.
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- RAWES, M. & HOBBS, R.J. 1979. Management of semi-natural blanket bog in the northern Pennines. *J. Ecol.*, 67, 789-807.
- RAWES, M. 1981. Further results of excluding sheep from high-level grasslands in the north Pennines. *J. Ecol.*, 69, 651-669.

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- WELCH, D. & RAWES, M. 1964. The early effects of excluding sheep from high-level grasslands in the north Pennines. J. appl. Ecol., 1, 281-300.
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- WELCH, D. 1968. Sheep grazing in northern England: some ecological considerations. In: Proc. European Grassld. Fed. Symposium on Hill Land Productivity (Ed. I.V. Hunt), 173-176.

Type II

- ARMITAGE, P.L. 1973. Northern Pennine Survey - an ecological assessment. M.Sc. Conservation Course, University College London. (Dissertation).
- MALLETT, MRS. C. 1972. The Upper Eden Valley - Challenge and Threat. M.Sc. Dissertation, University College London.

Type III

- FORREST, MRS. A. 1971. Garrigill: A study of a northern Pennine Village. 412 pp, (Unpublished Manuscript).
- GORE, A.J.P. 1969. Ecosystem simulation. Merlewood Research Station 'Research and Development Paper' No. 12.
- GORE, A.J.P. 1970. A method of estimating optimum sampling numbers with an application to productivity studies on vegetation. Merlewood Research Station 'Research and Development Paper', No. 18.
- HEAL, O.W. 1968. The International Biological Programme Project at Moor House. Merlewood Research Station 'Research and Development Paper', No. 2.
- JONES, HELEN E. 1969. A preliminary survey of Potassium circulation in the Moor House blanket bog. Merlewood Research Station 'Research and Development Paper', No. 10.



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