Shelford

Victor E. Shelford
University of Illinois

V. E. Shelford
Vivarium Building
Wright and Healey Streets
CHAMPAIGN, ILL.

December 2, 1952

COPY

Dear Mr. Collins:

I am flattered by your letter.

Begin natural history at age two years. Do quantitative work always---qualitative only when you can do no better. Study factors controlling fecundity experimentally; watch of short critical sensitive periods, measure environmental factors continuously especially solar radiation. Population is one of the basic problem of plant and of animal ecology.

Don't let the test tube "glamour boys" fool you into devoting too much of your time to mathematics, physics and chemistry---get a good broad biological education in both plant and animal. I met a Columbia Ph.D., Zoology, yesterday who did not know that 30,000,000 American antelopes once roamed the plains. He did not know of its existence. If you get stuck with physics or chemistry or statistics, hire a good senior major in the field to tutor you. You can't learn everything while in college and university and you can't work statistics occasionally without loss of time.

(Signed) V. E. Shelford

Tansley

Arthur G. Tansley
Oxford University, U.K.

From:

Sir Arthur Tansley
Grantchester,
Cambridge

17 January 1955

Dear Mr. Clark:

Thank you for your letter just received. In view of what you write, I do not think we need bother about getting the list of my publications full and accurate.....I will content myself (and I hope you) with some general remarks, as you ask, though I fear you will not find them very interesting.

I used to collect and dry plants when I was quite a young boy, probably owing to the influence of a master who was a keen field botanist at the preparatory school I attended. But my first attraction to modern plant ecology was at the age of 28 when I read Graebner's German edition of Warming's Plantesam fund (Oecologische Pflanzengeographie). (I had graduated in Botany at Cambridge in 1893, and went immediately to be assistant to F. W. Oliver, who was Professor of Botany at University College, London. I remained with him for 13 years, and it was during that period that I read Warming.) I found the idea of plant communities fascinating and tried to apply Warming's descriptions to the countryside of Kent and Surrey. I then read Schimper's Pflanzengeographie auf physiologishes Grundlage, and Oliver and I used the points of view in these books for teaching our students on day excursions. We also took a number of the advanced students for a fortnight each summer to the Bouche d' Erquy on the coast of Brittany, where there is good salt marsh in the estuary and a fairly good spot of sand dunes protecting the marsh. There we soon collected all the species of flowering plants and many of the algae, and made the students survey and map communities of the whole estuary on a large scale. In later years Oliver took similar parties to Blakeney Point on the north coast of Norfolk where there is not only salt marsh and sand dune vegetation but also good shingle beach, including a very local Mediterranean species, Suaeda fruticosa. Oliver and I were attracted to this maritime vegetation because it is not messed about by human activities, as most of our countryside is, and because of its clear zonation in relation to the tides. (But in 1906 I migrated to Cambridge and held a lectureship there till 1923 when I resigned the post; and at the beginning of 1927 I was elected to the Professorship of Botany at Oxford. I held this post for 10½ years, retiring under the age limit in 1937.) I taught ecology both in London and at Cambridge & Oxford, but my research up to 1906 was almost entirely in fern anatomy, and I taught plant anatomy as well as ecology.

In 1904 I founded a small committee of botanists working actively at ecology, and in 1913 we transformed this into the British Ecological Society and started the Journal of Ecology, which I edited from 1916 till 1937. With the help of members of this committee I produced Types

of British Vegetation in 1911 on the occasion of the first International Phytogeographical Excursion (through the British Isles) to which we invited several oversea botanists, including Cowles and Clements (and their wives). We also had with us Schroeter and Rubel from Switzerland, Flahault from France, Massart from Belgium, Stomps from Holland, Lindman from Sweden, Ostenfeld from Denmark and Graebner from Germany. It was a great success and the "I.P.E." has become a permanent institution, visiting Switzerland, Scandinavia, Hungary & Rumania (before the days of the Iron Curtain), Italy, Morocco & Algeria, and (last year) Spain. The HQ is the Rubel Institute in Zurich. I have always felt that ecology (even more than other branches of science) ought to be international, though, of course, it is true of all science. Cowles & Clements were so pleased with this venture that they organized the Second I.P.E. in the U.S.A. in 1913. (The two World Wars have, of course, interrupted the smooth sequences.)

As for my work in ecology, it really doesn't amount to much in the way of research. My most important contribution is certainly The British Isles and their Vegetation, published in 1939, six weeks before the second World War broke out. It was intended to replace Types of British Vegetation which has long been out of print, and was also, of course, more or less out of date too! I couldn't get it finished till I left the exacting work of the Oxford chair behind me. (Since this last war I have done very little, except helping to found The Nature Conservancy--a minor Government Department of which I was appointed the first Chairman in 1949. I had to give it up in 1953 owing to increasing deafness, but I still attend the meetings. Also I am now very shaky on the legs so that field work is impossible. I am 83.)

I should say the most important thing I have done, apart from the big book, is to stimulate and advise younger men (pupils and others) who were doing, or wanted to do, ecological work.

As to my general views on ecology, the easiest way to convey them to you is to ask you to read some pages of the Preface to the British Islands and their Vegetation (pp. vi to ix) and Part III. Chapter 10 on "The Nature of Vegetation:" also the relevant parts of my Introduction to Plant Ecology in which my ideas of the essentials of the subject are stated as well as I can state them (Third edition, fourth impression, 1954). You will, of course, realize that this book is intended primarily for English students so that the examples discussed are nearly all from this country.

As for current trends, I have nothing much to add to what I have written in the Introduction. I think autecology is the most important line to pursue--particularly of dominant species. Field experiment is of great importance. Quantitative results are, of course, always to be obtained if the phenomena permit of them, but they should not be made a fetish. "All science is measurement" is an aphorism which should not be pressed too far, and as Bateson used to say "all measurement is not necessarily science." Much study which cannot be pursued

quantitatively is of vital importance. But I do not underrate the great value of statistical treatment of appropriate data.

You will gather from my writings that I am conscious of the very great debt I owe to Clements' work. As I said in the obituary notes I wrote, I think it is the greatest contribution ever made to ecology, though I do not accept some of his extreme views--such as that vegetation is an organism! I knew Cowles, Clements and Shantz quite imtimately and benefited very much from my intercourse with them, as well as keenly enjoying their society.

Yours sincerely

(signed) A. G. Tansley

TANSLEY BOTANICAL PUBLICATIONS

1901 and Miss E. Chick Notes on conduction tissue system in Bryophyta. Ann. Bot. 15:1-38.

1902 with R. B. Lulham. On a new type of fern stele and its probably phylogenetic relations. Ann. Bot. 16:157-164.

____ (Paper on the anatomy of Matonia).

1908 Evolution of the filicinean vascular system.

1911 (ed.) Types of British vegetation by members of the Central Committee for the Survey and Study of British Vegetation. Camb. 416 pp.

1913 In "Hampstead Heath, its Geology and Natural History." Chap. IV. pp. 87-92.

1913 Primary survey of Peak District of Derbyshire. Jour. Ecol. 1:275-285.

1913-14 International Phytographic Excursion in America. New Phytol. 12:322-336, 13:30-41, 83-92, 268-275, 325-333.

1916 The development of vegetation. A review of Clements' Plant Succession. Jour. Ecol. 4:198-204.

1920 The Classification of vegetation and the concept of development. Jour. Ecol. 8:118-148.

1922 Early stages in the development of woody vegetation on chalk grassland. Jour. Ecol. 10:168-177.

1922 Elements of plant biology. London (An elementary textbook for students with emphasis on general biology) A.G.T.

1923 Practical plant ecology. Lond. 228 pp.

1925-26 and R.S. Adamson. Studies of the vegetation of the English Chalk. III. The chalk grasslands of the Hampshire-Sussex Border. Jour. Ecol. 13:177-223. IV A preliminary survey of the chalk grasslands of the Sussex Downs id. 14:1-32.

1926 (ed. with T.F. Chipps) Aims and methods in study of vegetation. British Empire Vegetation Committee and Crown Agents for Colonies. Lond. 383 pp.

1929 Succession, the concept of its values. Intern. Congress Plant Science. (1926) Ithaca Proceedings 1:667-686. New York. (A critical consideration of the use of the word "succession as a technical term in plant ecology) A.G.T.

1934 (translation) The life forms of plants and statistical plant geography, being the collected papers of C. Raunkiaer. Oxford 632 pp.

1935 The use and abuse of vegetation concepts and terms. Ecol. 16:284-307.

1939 The British Isles and their vegetation. Camb. 930 pp. 2nd printing with corrections, 2 vols. (1949).

1941 Notes on the status of salt marsh vegetation and the concept of "formation." Jour. Ecol. 29:212-214.

1945 Our heritage of wild nature. Camb. 74 pp.

1946 and E. P. Evans. Ecology and the School.

1946 Introduction to plant ecology.

1947-48 The early history of modern plant ecology in Britain. Jour. Ecol. 35: 130-137; 36:180.

1948 Peculiarities of southern Australian vegetation. Jour. Ecol. 36:181-183.

1949 Britain's green mantle. London (a semi-popular account of British vegetation based on the author's standard work "The British Isles and their vegetation" 1939) A.G.T.

1952 Oaks and Oakwoods.

Sir Arthur Tansley, Kt., M.A., F.R.S., Hon. Fellow Trinity College, Cambridge.

1871	Son of George Tansley, M.A., Working Men's College, London
1903	Married Edith Chick. Three daughters. Resides: Grantchester, Cambridge
	Highgate School University College, London
1893	Trinity College, Cambridge
1893-06	University College, London, demonstrator, assistant professor
1902-32	New Phytologist, founder and editor
1906-23	Cambridge, University lecturer in botany
1913-15	British Ecological Society, president
1915	Royal Society fellow
1916-37	Journal of Ecology, editor (official organ of British Ecological Society)
1923-37	Oxford, Fellow Magdalen College and Sherardian Professor of Botany (1927)
1937	Oxford, Professor Emeritus
1938-40	British Ecological Society, president
1941	Linnean Gold Medal
1947-53	Council for the Promotion of Field Studies, president
1947-53	The Nature Conservancy, chairman
1950	Knight

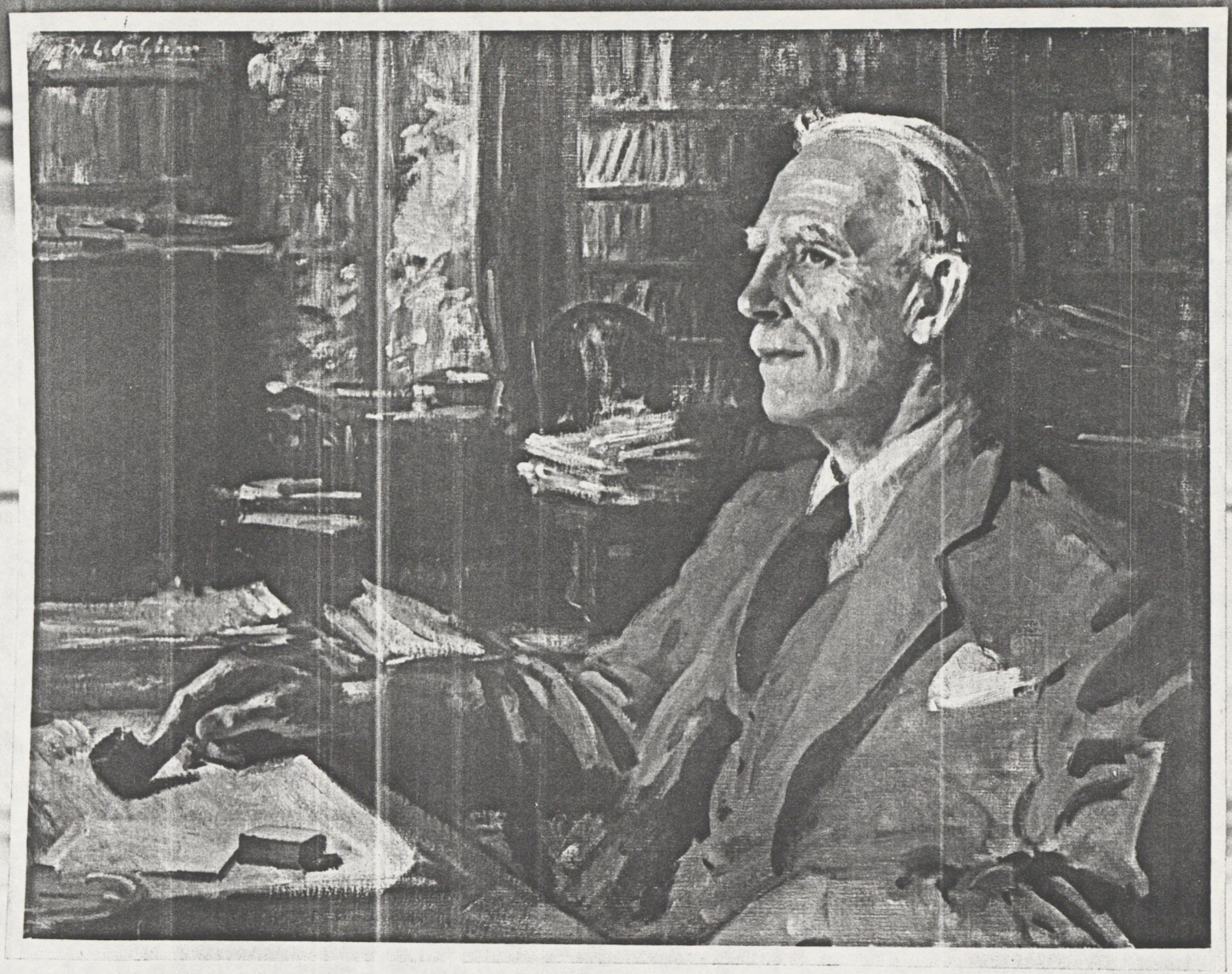
ARTHUR GEORGE TANSLEY

(aged 69)

reproduced from an oil portrait by Wilfrid de Glehn, R.A.

June, 1940.

RAMSEY & MUSPRATT,
POST OFFICE TERRACE,
CAMBRIDGE.
No. C 853/1

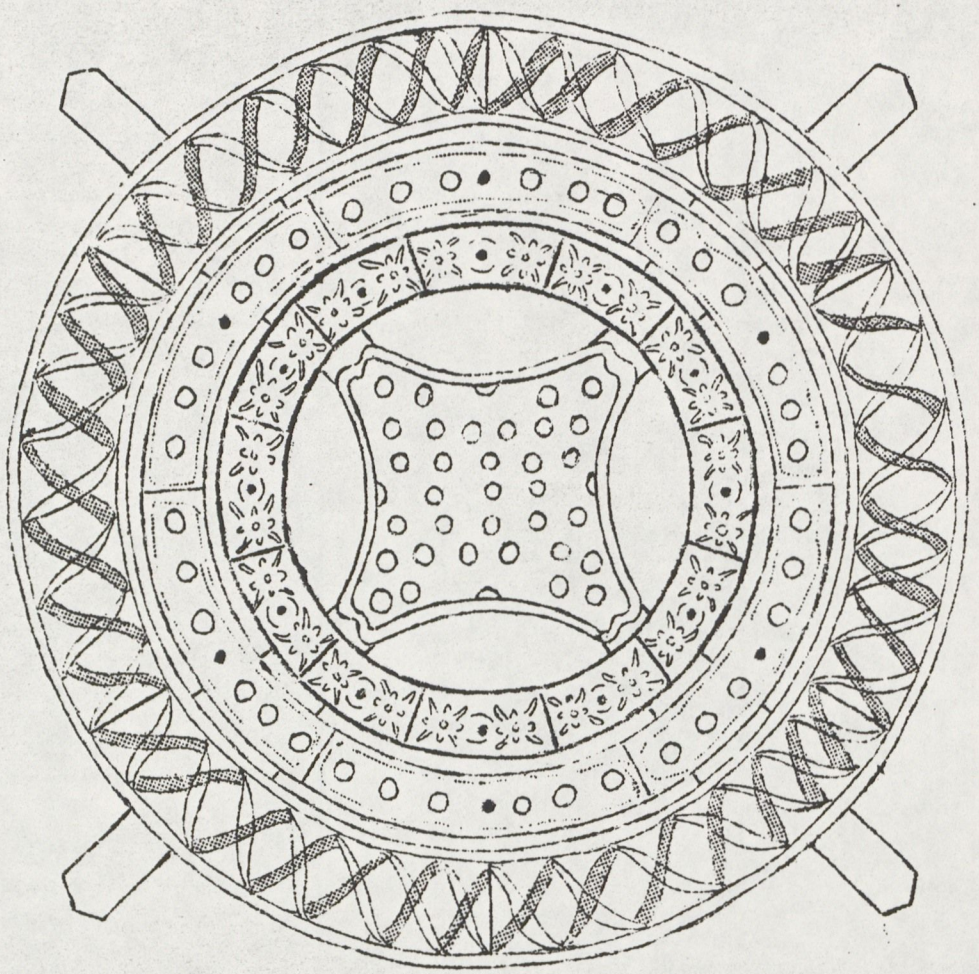


Transeau

Edgar N. Transeau
Ohio State University

EDGAR N. TRANSEAU

EDUCATOR–PHYCOLOGIST–ECOLOGIST



(The above design was reproduced from the dedication page in Dr. Transeau's book, The Zygnemataceae. The three concentric rings represent, respectively from the inside out, filaments of Zynema, Mougeotia, and Spirogyra. The central design is fashioned after the zygospore of Mougeotia gracillima.)

2079 West Fifth Ave.
Columbus 12, Ohio

March 20, 1953

Dear Mr. Patten:

This answer to your letter of March 3rd has been delayed by an attack of influenza. I am sending you a complete list of my publications most of which were only of momentary interest. At the time of my retirement in 1946, I disposed of all my worthwhile separates.

I must decline to attempt to evaluate my contributions to plant ecology. Most of my suggestions have either been embodied in the literature or forgotten. That is as it should be. The earlier papers can be appraised at the present time only if one appreciates the attitude of many botanists toward the younger men who undertook to study plants in the field, to measure environmental factors, and to analyze the structures and processes of plant communities.

While studying with Cowles at Chicago, I became especially interested in the physiological aspects of Ecology and ever since that time I have directed attention to the study of plants in their natural habitats--and the effects of edaphic, aquatic, climatic and microclimatic factors. With the aid of students many kinds of measurements have been made, some of which have given most unexpected results and clarified the problems involved. Many other measurements are still in notebooks because our instruments and methods proved to be inadequate for the solution of the problem. But every year adds to the available instruments and better procedures, and progress is assured.

Meanwhile, I became engrossed in teaching and from the beginning I felt the need of a general course in botany for all students that would offer them something more than the usual study of reproductive structures (mostly in sections) and ten sanctified but improbable steps in evolution. A large part of the problems that students bring to the classroom are essentially ecological. To solve these problems the student must have a clear understanding of plant processes. For this reason, we built our general course around the processes. Probably the best contributions I have made to Ecology are the facts and principles embodied in this course, and now presented in the "2nd Edition, Textbook of Botany", published by Harper & Bros. 1953.

My papers on freshwater algae began with a study of "algal periodicty" in relation to under-water factors. But the discovery that the ponds, ditches, and small streams of the prairie peninsula had the richest algal flora then known led me into taxonomy which culminated in the book on the "Zygnemataceae" published by the University Press September, 1951.

I have checked the more important papers listed according to my own evaluations. I hope this summary will be helpful to you.

Sincerely,

E. N. Transeau

Biographical Sketch of E. N. Transeau

Material compiled from American Men of Science, 8th Edition, 1949; and Who's Who in America, Volume 27, 1952-53 by B. C. Patten.

Home Address: 2079 West Fifth Avenue, Columbus, Ohio

1875 - Born Edgar Nelson, Williamsport, Pennsylvania, August 21, to Samuel and Martha Edith (Zimmerman) Transeau.

1897 - A.B., Franklin and Marshall College, Lancaster, Pennsylvania

1897 - 1900 - Taught high school, Pennsylvania

1899 (Summer) - Studied at Marine Laboratory, Brooklyn Institute of Arts and Sciences

1900 - 01 - University of Chicago

1901 - 02 - University of Colorado, Boulder, Colorado

1904 - Ph. D. (Botany), University of Michigan

1904 - 06 - Professor of Biology, Alma College, Alma, Michigan

1906 - Married Gertrude Hastings (M.D.), August 23; one daughter, Elizabeth Hastings (Mrs. August Mahr).

1906 - 07 - Investigator at Station for Experimental Evolution, Cold Spring Harbor, Long Island.

1907 - 15 - Professor of Botany, East Illinois State Teachers College, Charleston, Illinois

1915 - 46 - Professor of Plant Physiology and Ecology, Ohio State University, Columbus, Ohio; Chairman of Department from 1918 to 1946.

1923 - 24 - Staff member, Cold Spring Harbor.

1926 - 28 (Summers) - Experiment Station, Ohio State University.

1927 - European agent (plant ecology), Bureau of Entomology, U.S.D.A.

1929 - 32 - Collaborator, Central States Forestry Experiment Station.

1946 - Retired

* * * * *

HONORS

1901 - Honarary D.Sc.; University of Chicago

1924 - President, Association of American Geographers

1924 - President, Ecological Society of America

1924 - President, Ohio Academy of Science

1940 - Fellow, American Association for the Advancement of Science

1940 - President, Botanical Society of America

1941 - Honorary Sc.D.; Franklin and Marshall College

1949 - Honorary Sc.D.; Ohio State University

1951 - President, Phycological Society of America

? - Fellow, American Geographical Society

? - Phi Beta Kappa

? - Phi Kappa Sigma

? - Sigma Xi

? - Member of American Nature Society

* * * *

Publications of Edgar N. Transeau

(Asterisks indicate those papers which the author personally evaluated as his "more important papers". The parenthetical remarks are those he provided on the original list).

* * * *

1903 - On the geographic distribution and ecological relation of the bog plant societies of northern North America. Bot. Gaz. 30: 401-420.

1904 - On the development of palisade tissue and resinous deposits in leaves. Science. New series 19: 866.

1905 - Climatic centers and centers of plant distribution. Annual Report, Michigan Acad. Sci. 7: 73.

1905-06 - The bogs and bog plants of the Huron River Valley. Bot. Gazette. 40: 336-375; 40: 318-448; 41: 17-42. (Ph.D. Thesis)

*1905 - Forest centers of Eastern America. American Naturalist. 39: 875-889 (See recent publications of Thornthwaite who has really solved the problem).

1907 - Hybridization a factor in migration and competition. Science. 25: 269-270.

1907 - A simple hypsometer. School Sci. & Math. 7: 114-118.

*1908 - The relation of plant societies to evaporation. Botanical Gazette. 45: 217-231.

1909 - The relation of the climatic factors to vegetation. American Naturalist 43: 487-493.

1909 - The point of view in vegetation problems involving climate. Plant World 12: 102-105.

1909 - Successional relations of the vegetation about Yarmouth, Nova Scotia. Plant World 12: 1-11.

1910 - Forestry experiment at the Eastern Illinois State Normal School. Illinois Arbor & Bird Day Annual.

1910 - A simple vaporimeter. Botanical Gazette 49: 459-460

1911 - An experimental microcosm. School Sci. & Math. 11: 263-264.

1911 - The occurrence of the rare alga Gloeotaenium in Illinois. Transactions Illinois Acad. Sci. 4: 143.

1911 - Apparatus for the study of comparative transpiration. Botanical Gazette 52: 54-60.

1912 - Studying trees afield. Illinois Arbor & Bird Day Annual. pp 1-15.

1913 - The life history of Gloeotaenium. Botanical Gazette 55: 66-73.

*1913 - The periodicity of algae in Illinois. Transactions Amer. Micros. Soc. 32: 31-40.

1913 - The passing of the teleological explanation. School Science and Mathematics 13: 369-381.

1913 - The vegetation of Cold Spring Harbor, Long Island. 1. Littoral Series. Plant World 16: 189-209.

1913 - Annotated list of the algae of Eastern Illinois. Transactions Illinois Acad. Sci. 6: 69-89.

*1914 - Seasonal variations of the osmotic pressure of pool, pond and stream waters. Science 39: 260.

1914 - New species of green algae. Amer. Jour. Bot. 1: 289-301.

1916 - Notes on the Zygnematales. Ohio Journal of Science 16: 17-31.

*1916 - The periodicity of freshwater algae. American Journal of Botany 3: 121-133.

1917 - The algae of Michigan. Ohio Journal of Science 17: 217-232.

1918 - A new species and a new variety of alga for Oneida Lake, N.Y. Tech. Pub. New York State Coll. Forestry. No. 9 page 237-238.

1919 - Science of Plant Life, pp 1-336, World Book Co.

1919 (with H. Tiffany) - New Oedogoniaceae. Ohio Journal of Science 19: 240-243.

*1919 - Hybrids among species of Spirogyra. American Naturalist 53: 109-119.

1923 - General Botany, pp. 1-560, World Book Company

1923 - Laboratory Manual in General Botany - World Book Company. (with Sampson)

1925 - The genus Debarya. Ohio Journal of Science 25. 193-201.

*1926 - The accumulation of energy by plants. Ohio Journal of Science 26: 1-10.

1926 - The genus Mougeotia. Ohio Journal of Science 26: 311-338.

*1926 - The corn borer and ecological habitats. Ohio agric. exper. station, Report on European Corn Borer, Sept. 1926, p. 28-29 (European Report to U.S.D.A. never published!-political hot potato.)

1927 (with Tiffany) - Oedogonium periodicity in the north central states. Trans. Amer. Micros. Soc. 46: 166-174

1927 - Vegetation types and insect devastations. Ecology 8: 285-288.

1928 (with Sampson) - Original plant associations as indices to biotic habitats of the corn borer. Bull. Ohio Agric. Exper. Sta. 429: 152-163.

1929 (with Williams) - Distribution maps of certain plants in Ohio. Bull. Ohio Biol. Surv. 4: 179-217.

1930 - Progress in the survey of the vegetation types of the north central states. Annals Assoc. Amer. Geog. 20: 45.

1932 - The genus Temnogametum. Ohio Journal of Science 32: 487-491.

1933 - The genus Zygogonium. Ohio Journal of Science 33: 156-162.

1934 - The genera of the Zynemataceae. Trans. Amer. Micros. Sco. 53: 201-207.

1934 (with Tiffany, Taft and Li) - New species of Zygnemataceae. Trans. Amer. Micros. Soc. 53: 208-230.

1934 - Notes on the Zygnemataceae. Ohio Journal of Science 34: 420.

*1935 - The prairie peninsula. Ecology 16: 423-437. (Missing paragraph should have been on nitrogen bacteria!!)

1935 (with Sampson and Tiffany) - Work Book in General Botany, pp 1-160. Edwards Bros.

1938 - Notes on the Zygnemataceae. Amer. Jour. of Botany 25: 524-528.

1940 (with Sampson and Tiffany) - Textbook of Botany, pp. 1-812. Harper & Bros.

1941 - Prehistoric factors in the development of the vegetation of Ohio. Ohio Journal of Science 41: 207-211.

1944 - Global Georgraphy, G. T. Renner & Associates. Chapter 8, "Patterns of Vegetation" pp. 119-135. T. Y. Corwell Co.

1942 - The golden age of botany. Science 95: 53-58. Presidential address Bot. Soc. 1941 at Dallas Texas Dec.

1943 - Two new Ulotrichales. Ohio Journal of Science 43: 212-213.

1944 - Notes on Zygnemataceae. Ohio Journal of Science 44: 243-244.

*1951 - The Zygnemataceae, (Feshwater conjugate algae) Keys to the Genera and Species. Sept. 1951. pp. 326, Pl. 42
Ohio State Univ. Press. Grad. School Monograph. Botany No. 1

1949 - Fruiting patterns of Coprinus variegatus Peck. American Journal Botany 36: 596-602. (Final summary still to be pub.)

*1953 (revised) 2nd Edition - Text Book of Botany. Harper & Brothers. (with Sampson and Tiffany)

* * * *

Turrill

William B. Turrill
Royal Botanic Gardens, Kew, U.K.

William Bertram Turrill

Biographical Sketch (from Who's Who, 1959, and private communication from Dr. Turrill)

1890- Born at Woodstock, Oxfordshire, June 14. Son of William Banbury Turrill. Eldest son of 4.
1906- Left school at 16 and was employed for 2 and ½ years at the Fielding Herbarium of the University of Oxford.
1909- Appointed to a technical post at the Herbarium of the Royal Botanic Gardens, Kew, January 18.
1914- Appointed to post of Botanist in the Kew Herbarium.
1918- Married to Florence Emily Homan.
1946- Appointed Keeper of the Herbarium and Library, Royal Botanic Gardens, Kew, in February.
1947-present- Editor of Curtis's Botanical Magazine (for the Royal Horticultural Society).
1957- Retired, September 30.

Higher Education:
B.Sc.-Chelsea College of Science, with first class honors in Botany. Gained through evening classes.
M.Sc., D.Sc.-University of London.

Awards:
Fellow of the Linnaean Society (F.L.S.)
Fellow of the Royal Society (F.R.S.)
Order of the British Empire (O.B.E.)
Veitch Memorial Gold Medal
Victoria Medal of Honour (V.M.H.)
Linnaean Gold Medal
Past President of the British Ecological Society
Past President of the Botany Section (k) of the British Association for the Advancement of Science.

Recreations: Gardening and Walking

Letter from William B. Turrill

30 October, 1959

Dear Mr Davidson,

In reply to your letter of 11 Oct. I have done my best to meet your request, except that I do not feel qualified to answer all your questions and particularly 6 and 7. To attempt to answer these would take a very long time and I am much to busy to make even a start and you would certainly not get a reply for your date in December.

I trust what I have said may be of some interest and use.

Yours sincerely

(signed)
W.B.Turrill

The chronological biographical sketch sent by Dr. Turrill is included in that on page one.

Interest in Botany due largely to inherited tendencies especially from my mother who was a keen gardener and to early influence of my mother and of a school teacher combined with living till I was 18½ in the country. I commenced by collecting and naming local wild and cultivated plants when I was 5 or 6 years old. At the beginning of my teens I commenced forming a herbarium of local plants. I thus has a fairly good knowledge of the flowering plants of central England as a basis for further studies in Botany when I left school and before I went to Kew I had obtained a very fair groundwwork in plant anatomy and plant physiology and in the life histories of the major groups of cryptogams.

Soon after arrival at Kew I took up the serious study of science and, by attending evening classes in London, matriculated in the London University and went on to obtain my Intermediate and finals with the degree of Bachelor of Science (first class honours in Botany). The subjects taken in science were chemistry, mathematics, geology, and botany. The finals courses were in Botany and Geology(Geology as subsidiary). One matter perhaps worth comment is that the field knowledge I had obtained in my youngest days of the local flora - direct personal experience with a minimum of help from teachers or from books but including the use of a microscope which I had saved up my pocket money to but - was and always has been of the greatest possible use. To know by characters and names the plants of a local flora gives one a very firm foundation of facts on which to build an increasing knowledge of plant life.

I served in the British Salonika Forces in Macedonia in the First World War. This meant a considerable break in my researches but had one positive effect in that it directed

my attention to the flora and vegetation on the Balkan Peninsula to which I devoted as much time as I could from 1918 onwards. In order to obtain money for visits to various parts of the Balkan Peninsula I did a considerable amount of evening teaching for Botany degree and other courses in London. I thus obtained a good deal of experience in teaching and lecturing and this has stood me in good stead since. A certain amount of teaching is highly desirable for every research worker since it tends to clear his mind, makes him realize the wider implications of his own special subject, and helps to keep him balanced by reducing his conceit.

My own research has been mainly in the realm of synthetic plant taxonomy and in plant geography. I have had a considerable amount to do with pure taxonomy officially as a botanist in and later as keeper of the Herbarium and Library at Kew. My interests, however, have not been in the narrow sphere of description and nomenclature, which I regard only as tools, but in the attempts to widen the base and scope of taxonomy (mainly of seed-bearing plants) by including experimental and observational data from phytogeography, ecology, cytogenetics, etc., and reciprocally to aid these disciplines by improving on as wide and sound a basis as possible the taxonomy specialists in these subjects have to use.

Briefly, I regard my main contributions to Botany as the following:

1. Researches on the plant life of the Balkan Peninsula. These have been published in the book "Plant Life of the Balkan Peninsula", Oxford 1929, and in numerous papers in scientific journals at home and abroad. I still retain deep interest in this subject and constantly give help to those working in the area.

2. Wider aspects of plant geography. Thus, I published the book "Pioneer Plant Geography", dealing with and attempting to bring up to date the phytogeographical researches of Joseph Dalton Hooker (the Hague, 1953). I have also written various articles on this subject as in the Journal of Ecology, Journal of the Linnaean Society, and in "Vistas in Botany".

3. Experimental and field studies linking taxonomy, cytogenetics, and ecology with reference to a limited number of species. Such included (in collaboration with E.M.Marsden-Jones) conducting the Transplant Experiments at Potterne, Wilts, and Kew for the British Ecological Society, the results of which were published in the Journal of Ecology 1928 onwards; controlled experiments combined with field investigations of species of Silene, Centaurea, Ranunculus, Anthyllis, Primula, Saxifrage, Solanus, and a few other genera. Many papers have been published on the results in the Kew, Bulletin, the Journal of Genetids, and other periodicals. The work on Silene was published in book form by the Ray Society in 1957 and that on Centaurea by the Ray Society in book form in 1954. The work under this heading has been markedly synthetic with a taxonomic bias. That is to say the experiments and field investigations were planned to determine the value of characters used in taxonomy, to exten(t?) them, and

to integrate the findings of all possible lines of research under the heading of taxonomy sensu latissimo.

4. Misdellaneous. In 1948 I published "British Plant Life" (London) which attempted to give a general introduction, from the standpoint of studying plants in the wild and in the experimental ground and within the limits of the British Flora, for students and the many amateurs interested in botany in this country. The idea was largely to encourage a break away from the older concepts of merely collecting and recording "new county records" and to urge both school and college students and those who took up botany as a hobby to study plants intensively as subjects of research. A new edition has just been published of this book.

Since the last war I have been closely associated with the Royal Horticultural Society. Besides serving on half-a-dozen of their committees I have (since 1947) edited and to the extent of one third to one half have prepared the text for the "Botanical Magazine" which is the oldest botanical periodical still in course of publication. This means that I have to keep in c lose contact with certain branches of horticultural?and especially with the introduction of new plants to British gardens from overseas.

In connection with the bicentenary of the Royal Botanic Gardens, Kew, I wrote and published a history of the Gardens and an account of their present make-up under the title "The Royal Botanic Gardens, Kew, Past and Present", (Herbert Jenkins Ltd., London, 1959) and also edited and contributed to a commemorative volume with the title "Vistas in Botany" (Pergamon Press, London, 1959).

My immediate plans are to continue with the editorship of the Botanical Magazine and to complete my monographic account of the genus Fritillaria.

I have collaborated mainly with E.M.Mardden-Jones formerly of Potterne, W ilts, in experimental work at the Potterne Biological Station and at Kew. I have kept no lists of students who have attended my courses or who have been, at least in part, trained by me. I feel that to attempt to give such a list from memory would be invidious as I should certainly leave gaps.

To prepare an outline, even a brief one, of British ecology from early beginnings to the present time would be a task occupying my whole time for many months - even if I were qualified to do this. Similarly I do not feel qualified to offer any comments likely to have value regarding the subjects you raise under your headings (7) and (8) except to say that in my work on the Flora and Vegetation of the Balkan Peninsula and in teaching ecology to British students I have found the Clementsian schemes of Plant Succession and, within limits as criticized by Tansley and others, the Theory of Climax of very great use and interest.

A s regards training for ecologists and course work, I would suggest that the following be given consideration:

1. A broad training and a broad outlook is essential. Ecology in itself is a synthetic subject and it is necessary to have

a wide knowledge of various related subjects. Practical taxonomy is essential and no student should be encouraged to take up ecology who is not willing to "learn the flora" of the area or group he is to investigate ecologically. In addition a student of ecology should have a good working knowledge of geology, pedology, plant physiology, and statistics, at least.

2. Students should be taught to keep records properly and given lots of practice in this.

3. As far as possible ecology should be taught in the field. Certainly all problems should have as a background "what happens in nature." This means constant reference from results of controlled experiments in laboratory or experimental ground to natural communities and conditions.

4. Every center of ecological teaching and research should have an experimental ground.

5. In particular, I regard the need to link ecology more and more with taxonomy and with cyto-genetics as paramount. So far as European ecology is concerned this means a greater concentration on autecology where the field for research is very extensive. In group after group the taxonomist can only go so far without many more data from ecologists and cyto-geneticists.

A complete list of my publications is filed in the library of the Royal Botanic Gardens, Kew. No doubt permission to have this copied could be obtained if you wish.

(signed)
W.B.Turrill

Letter from D.Davidson to Dr. W.B.Turrill

October 11, 1959

Dr. William B. Turrill
26 Ennerdale Road
Richmond, Surrey,
England

Dear Dr. Turrill:

This letter and its purpose may come to you as somewhat of a surprise. By way of explanation I am a graduate student in Plant Ecology or Phytosociology, depending on the terminology preferred, at Rutgers University, New Brunswick, New Jersey, United States, and am studying under Dr. Murray F. Buell, Plant Ecologist.

In the year 1952, a seminar program was initiated in the Botany Department in which the ecology graduate students gave monthly seminars dealing with eminent ecologists, and during the first several years the program was confined more or less to American ecologists. Now, however, the lives of a great many contemporary American ecologists have been reviewed so that their number has been reduced considerably. In addition to this, we are interested in finding out the views of European ecologists as compared with those of A merican's. Could you please take time and answer the following series of questions?

(1) We would be interested more than anything else in the history of your life in as detailed an account as possible, with emphasis on the development of the concepts around which your own interests or research have centered. Just why were you interested in plant science in general? Please don't hesitate to include experiexperiences which you have hadñ, not directly related to botany.

(2) What do you feel have been your most significant contributions to plant science, and in particular to ecology?

(3) We would be especially interested in obtaining a complete list of your publications, to have on permanent file for our seminar programs, as well as a list of the Biological organizations and activities with which you have been associated.

(4) If you have available any reprints of publications which we could review, could these be sent to us?

(5) Could you please provide us with names of people who have worked with or under your, and who have gone on to make significant contributions in plant science?

(6) Would you briefly outline the development of British ecology, from early beginnings to the present time?

(7) Could you give a brief sommentary on the development of American ecology during the past 10 years, particularly with regard to the continuum concept of Curtis and others at Wisconsin, and Whittaker?

(8) What do you feel were the real contributions of the Clementsian Theory of Climax?

(9) What are your future plans for scientific activities?

(10) What do you feel should be the training for ecologists, with regard to course work while they are graduate students?

In addition, could you please clarify the following symbols with regard to yourself?

(1) O.E.B. 1955

(2) V.H.M. (Royal Horticultural Society)

(3) F.L.S.

I hope that the questions which have been presented are not too long and involved. The seminar is to be presented during the first or second week of December, as if possible, a reply somewhat prior to that time would be greatly appreciated.

Sincerely yours,

Donald Davidson

Turrill

A Partial Listing of the Writings of Dr. William B. Turrill Royal Botanic Gardens, Kew, England

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Tab.8 Fritillaria pontica var. ionica
Tab.9 Dianthus haematocalyx var. alpinus
Tab.14 Orphanidescia gaultheroides.
Tab.21. Colchicum lusitanum
Tab.26 Polygonum tenuicaule
Tab.29 Cyclamen vernum
Tab. 30 Doryphora sassafras
Tab.35 Mensiesia ciliicalyx var. Eglandulosa
Tab.36 Hypericum ericoides
Tab.37 Ceanothus purpureus
Tab.41 Viburnum hupehense
Tab.43 Atherosperma moschatum

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Tab.49 Bredia tuberculata
Tab. 53 Carriera calycina
Tab.57 XDaphne burkwoodii
Tab.61 Metrosideros florida var. aurata.
Tab.62 Tetratheca ciliata
Tab.63 Fritillaria camschatiensis
Tab.67 Chrysanthemum ochroleucum
Tab.69 Sorbus scalaris koehne
Tab.77 X Caryopteris clandonensis
Tab.76 Renzania japonica
Tab.77 Lysimachia atropurpurea
Tab.80 Stevia salicifolia
Tab.82 Cynoglossum amabile var. parviflorum
Tab.86 Strobilanthes pentstemonoides.
Tab.88 Coprosma nitida

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Tab.91 Salix aegyptiaca
Tab.96 Sorbus hupehensis
Tab.97 Celsia acaulis X? Verbascum sp.
Tab.98 Verbena sabrido-glandulosa
Tab.100 Erica mammosa
Tab.101 Arum creticum
Tab.102 Jacquemontia corymbulosa
Tab.103 Viburnum dilatatum var. xanthocarpum
Tab.110 Schizocodon soldanelloides var. magnus
Tab.112 Moraea villosa
Tab.114 Korolkowia sewerzowii
Tab.118 Prunus webbii
Tab.123 Deutzia monbeigii
Tab.124 Muscari macrocarpum
Tab.129 Fritillaria sibthorpiana
Tab.130 Cotoneaster franchetii var. sterniana

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Tab.133 Sorbus pohuashanensis
Tab.135 Oenothera acaulis
Tab.136 Hebe vernicosa var. canterburiensis
Tab.137 Saxifraga macedonia
Saxifraga sancta
Tab.140 Sphaeralcea fendleri
Tab.142 Ephedra andina
Tab.149 Symplocos paniculata
Tab.150 Pseuderanthemum lindavianum
Tab.152 Ramonda nathaliae
Tab.154 Penstemon kunthii
Tab.156 Typhonium giraldii
Tab.163 Marsdenia creophila
Tab.164 Viburnum lobophyllum
Tab.165 Senecio webbii
Tab.166 Sorbus serotina
Tab.167 Bryophyllum daisgremontianu
Tab.168 Abelia chinensis
Tab.171B Pratia angulata
Tab.172 Cynara hystrix
Tab.175 Celsia sinuata

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Tab. 195 Muscari tubergenianum
Tab. 196 Eranthis X tubergenii
Tab. 199 Selago galpinii
Tab. 200 Drimys winteri var. chilensis
Tab. 206 Erica scabriuscula
Tab. 207 Chionoscilla allenii
Tab. 208 Euphoriba robbiae
Tab. 210 Ceratostigma plumbaginioides
Tab. 212 Geum coccineum
Tab. 215 Veltheimia capensis
Tab. 216 Narcissus pseudo-narcissus

Tab. 176 Endymion hispanicus
Tab. 177 Hebe macrantha
Tab. 178 Campanula reiseri
Tab. 180 Narcissus calcicola
Tab. 185 Chrysanthemum gayanum
Tab. 18? Chimonanthus praecox
Tab. 18? Ipheion uniflorum
Tab. 188 Moraea gigandra
Tab. 189 Deutzia X Rosea
Tab. 191 Gentiana asclepiadea
Tab. 192 Cyclamen rohlfsianum

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Tab. 220 Garrya elliptica
Tab. 222 Erica Bauera
Tab. 225 Senecio appendiculatus
Tab. 226 Ranunculus ficaria var. aurantiacus
Tab. 227 Fritillaria Pinardii
Tab. 228 Penstemon strictus ssp. strictiformis
Tab. 233 Vicia canescens

Tab. 242 Abies pinsapo var. vel Hybrida
Tab. 240 Convolvulus pitardii var. leuchchnous
Tab. 243 Melaleuca rhaphiophylla
Tab. 246 Narcissus longispathus
Tab. 249 Cestrum elegans var. Smithii

Tab. 237 Chorizema cordatum
Tab. 238 Rudbeckia speciosa
Tab. 239 Felicia pappei var. gracilis
Tab. 250 Clematis colensoi var.
Tab. 255. Fritillaria cirrhosa
Tab. 256 Campanula portenschlagiana
Tab. 258 Verbascum dimulosum
Tab. 262 Penstemon unilateralis

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Tab. 266 Alyxia pubescens
Tab. 268 Corylus maxima var. purpurea
Tab. 269 Echium pininana
Tab. 271 Acacia Howittii
Tab. 272 Daphne mezereum
Tab. 277 Adenium coltaneum
Tab. 279 Picrasma quassioides
Tab. 282 Cotoneaster X watereri
Tab. 283 Campanula Davisii
Tab. 288 Anoda cristata
Tab. 289 Correa backhousiana
Tab. 291 Helleborus X Sternii
Tab. 292 Genista Lydia
Tab. 296 Cyclamen libanoticum
Tab. 299 Cytisus X Kewensis
Tab. 302 Primula elatior X julia
Tab. 303 Gentiana saxosa
Tab. 304 Albizia lophantha
Tab. 305 Hovea longifolia var. lanceolata
Tab. 307 Cyclamen cilicium var.

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Tab. 310 Polemonium foliosissimum
Tab. 311 Acacia alata
Tab. 312 Ceratopetalum gummiferum
Tab. 313 Hibiscus huegelii
Tab. 314 Lychnis X Haggena
Tab. 315 Ruesselia X lemoinei
Tab. 316 Callistemon brachyandrus
Tab. 318 Choisya ternata
Tab. 320 Daphne X hybrida
Tab. 321 Macleaya kewensis (or M.X Kewensis)
Tab. 322 Acacia multriformis
Tab. 323 Lonicera X purpusii
Tab. 324 Convolvulus oleifolius
Tab. 325 Hedychium densiflorum
Tab. 326 Penstemon bradburii
Tab. 327 Cytisus stenopetalus
Tab. 328 Silene integripetala
Tab. 329 Ruttya fruticosa
Tab. 331 Papaver heldreichii
Tab. 332 Genista sagittalis
Tab. 333 Anthyllis montana
Tab. 334 Campanula poscharsky
Tab. 335 Lomatia hirsuta
Tab. 336 Silene schafta
Tab. 339 Erica canaliculata
Tab. 340 Crocus sieberi
Tab. 342 Lagunaria patersonii
Tab. 344 Daphne longilobata
Tab. 345 Cassia stipulaceae

Tab. 346 Veronica turrilliana — Curtis's Botanical Magazine
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The complete bibliography of papers by Dr. Turrill numbers more than 500, not all included here.

Alex S. Watt
Cambridge University, U.K.

A letter from Dr. Alex S. Watt to L.F. Ohmann

Dear Mr. Ohmann,

My address will explain why I haven't acknowledged your letter of the 18th. October sooner. Ihave been in the States since the beginning of June and am returning to England on the 20th. December.

I think the part of my life which has a bearing on my contribution to ecologyis the fact that I was brought up on a farm (in Aberdeenshire, Scotland), that at the University of Aberdeen I took a degree in Arts and in Agriculture as well as "majoring" in Botany.

In the Agriculture Curriculum there was a course in Forestry. I was attracted by it and at the end of it I discussed with the lecturer the possiblilty of going in for Forestry as a career. He advised me to "major" in Botany and specialize in Ecology - the intention being that I should qualify myself in Forestry by study in Germany.

This plan was upset by the outbreak of war in August 1914. Instead of going to Germany, I went to Cambridge and did research under Tansley. I was then appointed to a lectureship in Forest Botany and Forest Zoology to teach these subjects in the newly established Degree in Forestry. After about 3 years with the services in France I returned to Aberdeen and remained there until 1929, when I went to Cambridge.

Thus the war prevented my having any really formal instruction in Forestry. So I came to my first job without any bias and also of course without experience. This meant that from the beginning I saw the forest through the ecologists eyes and not through the foresters. My first lecture in Forest Zoology was on the earthworm as a promoter of the welfare of trees, whereas in the standard German texts no mention, other than incidental, is made of it. Instead emphasis was placed on the enemies of trees. All this of course is now changed, and, although I am sure I had no hand in the revolution in the forester's outlook, I was nevertheless in the vanguard of it, quite independently of the main stream.

Full of enthusiasm for my subject - I looked forward to the time when I could help forestry by the application of ecological principles to it. In fact, things have worked out the other way, for almost subconsciously I found myself interpreting vegetation in terms of principles already formulated by the forester for the forest. Instead of ecology helping forestry, forestry was helping ecology. Thus in non-forest vegetation where there is a dominant, there is a mosaic of patches or a pattern oriented round the life-history of the dominant species. Where there is no diminant, or where the competitive power

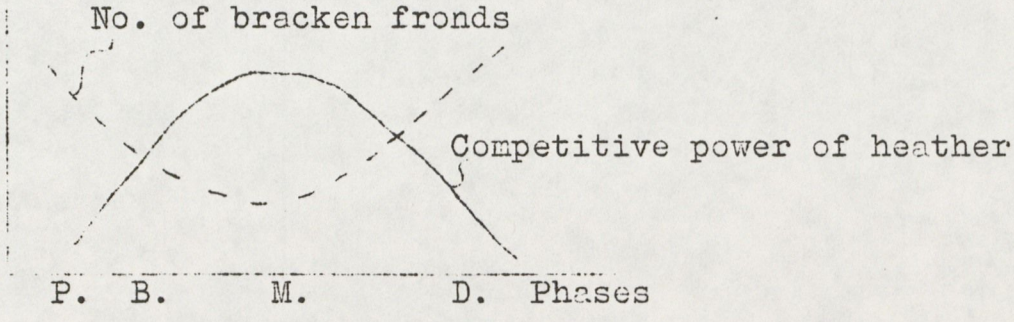
of the dominant species has been reduced or almost eliminated e.g. by grazing, then the physical and chemical factor of the habitat are primarily responsible for the structure of the community: and if there is a pattern then it is not related to the life-history of the most abundant species. Such communities conform to Gleason's phrase "a fortuitous juxtaposition of plant individuals".

Clements' contribution to ecology is in the establishment on a broad basis of the original formulation by Cowles of the principle of plant succession - in short - his injection of the dynamic principle into ecology. Clements emphasized the relationships between plant communities. All I am doing now is to extend this principle to the plant community itself for the phenomena of vegetation are the same in as well as between plant communities.

Papers published by me since Pattern and Process have drawn heavily for their interpretation on the principles enunciated there: particularly the study "Bracken v. Heather, a study in plant sociology" Journ. Ecol. 1954? or 5? There each of the communities dominated by bracken and heather respectively was interpreted in terms of the life-history of the dominant: and in the mixture of the two, the relationship between them is brought out very clearly in the following set of data obtained from a strip 100' X 4'.

		Phase			
		Pioneer	Building	Mature	Degenerate
No. of fronds per 10 sq. ft. of phase.	1954	5.6	1.9	0.6	4.7
	1955	9.1	2.4	0.8	3.9

Gleason's views are catered for in the variation in number from place to place with the changing environment, as they are also between the years, for the number of fronds is related to spring frost and rainfall during the growing season. But the set of data is integrated when you relate the variation in numbers in either year to the phases in the life-history of the Heather. And it is this sense of history which Clements injected into ecology.



I am now applying these principles to the control of plant communities. The static picture presented by current descriptions of plant communities is of little value when it comes to managing communities in the way you want. For this, one needs a body of data on the social relationships between the species, with the casual species at one end and the dominant at the other end of a series with a hierarchical network in between. More detailed information is required about the component species (particular ly the dominant), simple details like the duration of their life-history, (It is surprising how little we know of the duration of life of our common perennial plants) as well as less accessible information about factors influencing their competitive power.

This would point to more autecological studies. With this I agree but with this proviso that all information derived from autecological studies in the garden should be tested in the complex of its natural or community environment (climate, soil, plant and animal environment). In brief I would emphasize the need for knowing more about species: and much greater point would be given to studies of the physical and chemical environment when data about these are related not only to species but to stages in the life-history of a species, for different stages in the life-history of a plant are different ecological units both in their requirements and in their competitive relations with other species.

The above is my outlook on ecology in relation to present needs. It was presented in a paper at the semi-centenary meeting of the British Ecological Society in March 1963: the published work should appear early in 1964.

I am sorry I have no reprints.

As you can deduce from the above I have found the experience on the farm and its practical training, and at the university the classes on soil science, surveying etc. of great help. But of course this is not of much value unless it is combined with the urge to understand what is happening, and to carry back the simple happening in the field ultimately to the requirements of the plant and to what is happening inside the plant.

I haven't had enough experience of American Ecology to generalize. But in one aspect of ecology I have found that the Braun-Blanquet system of classification is being tested out quite successfully, but of course is still on trial.

I am, Yours sincerely,

/s/ Alex S. Watt

Partial bibliography of A. S. Watt

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Weaver

John E. Weaver
University of Nebraska
Dec. 23, '55

Dear Mr. Laycock:

This is in answer to your request for information of Dec. 12. Other materials are being sent under separate cover. Please add these references to the mimeographed list. The country needs many more good plant ecologists. I'm glad you are interested in this field.

ANSWERS TO QUESTIONS:

(1) How did you become interested in ecology or how did you start working in in the field of plant ecology?

A. "Became especially interested when I was appointed as instructor at Washington State College, Pullman Washington, a new and wonderful field."

(2) What do you consider your major contribution or contributions to plant ecology?

A. "(a) Studies of root systems 1919-1920, 1926-1927, 1949 (See Bibliography)

(b) The prairie, 1934; North American Prairie, 1954; Grasslands of the Plains, 1956 (Companion volume to N. A. Prairie).

(c) Drought, Soil conservation

(d) "Plant Ecology" text. Two editions and Spanish translation

(e) Doctorate theses of 42 Ph.D. students."

(3) What advice would you give a present graduate students in ecology concerning the types of courses he should take while at college and concerning practical experience during and after college?

A. "Two years of lectures with field, greenhouse, and laboratory work in ecology. Good knowledge of soils, plant physiology, applied taxonomy, physiography, general zoology. --Willingness to work hard, think and write clearly."

Autobiography- See American Men of Science, Who's Who, and the jacket of N. Amer. Prairie. A few recent papers are being sent under separate cover.

Sincerely yours
J. E. Weaver

Dec. 23 '55

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   (b) The prairie, 1934; North American Prairie, 1954; Grasslands of the Plains, 1956 (Companion volume to N. A. Prairie).

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Autobiographs - See American Men of Science, Who's Who, and the jacket of N. Amer. Prairie. A few recent papers are being sent under separate cover.

Sincerely yours
J. E. Weaver

JOHN EVEREST WEAVER (1884-)
(Biography from American Men of Science)

Born- Villisca, Iowa, May 5, 1884
Married 1906
Education, B. S. & A. M., University of Nebraska (1909 & 1911.
Ph.D. University of Minnesota 1916- Botany, Plant Ecology.
Instr. Botany, State College Washington; 1912-13; Asst. Prof. 1913-14.
Instructor Univ. of Minnesota 1914-1915
University of Nebraska- Asst. Prophesor, 1915-1917, Professor, 1917-1952
Emer. Prof. 1952-
Research Associate, Carnegie Institute of Washington 1922-1930.
Consultant USDA Soil Conservation Service.
Member editorial board of Ecology, 1923-24.
" " " " Ecological Monographs, 1931-32, 1940-42
Member of Committee on Ecology of Grasslands of North America
Natural Research Council, 1932-42.
AA; Bot Soc; Ecological Society (Pres. 30); Soc. Physiol.;
Nebraska Academy of Science (Pres. 36); Society of Soil and Water Conservation.

BIOGRAPHY PRINTED IN "NORTH AMERICAN PRAIRIE"

Dr. John E. Weaver, professor emeritus at the University of Nebraska, is a man internationally known and respected for his work in the field of plant ecology. During the past 40 years he has authored or cO-authored some 80 articles, 4 monographs, and 11 books. So valuable are his authoritative studies of root activities droughtm and the structure of grassland, that for 27 years he has been listed by American Men of Science as one of the nations 100 outstanding botanists.

His professional experience includes 8 years as research associate for the Carnegie Inst. of Wash., 10 yrs on the editorial board of Ecology, and 10 yrs. on the National Research Council's committee on the ecology of grasslands of North America. He has been the president of the Nebraska Academy of Sciences and the Ecological Society of America, and an honarary president of the 1950 International Botanical Congress

Dr. Weaver has influenced the field of ecology not only through his own publications but also through his work at Washington State, the Univ. ofMinn., and (for 38 yrs) the Univ. of Nebraska. Students from all over the U.S. and many foreigh countries have come to Nebraska expressly to work under Dr. Weaver's tutelage. He has supervised about 40 PhD. dissertations, all of which have been published

The present publication represents, indeed, the very peak of Dr. Weaver's achievement, for it distills the results of alifetimes uninterrupted, laborious field research.

Dr. L. A. Stoddard of Utah State Agricultural College, in reviewing an earlier work by Dr. Weaver, weote: " There comes occasionally to every scientific field a man who is so enthusiastic, and so devoted to his work that it becomes his very life. To him nature seems to unfold her secrets in response to his devotion; his ability to understand and communicate with nature becomes an inspiration to students and fellow workers alike. Such a man is J. E. Weaver in the field of American grassland ecology."

PUBLICATIONS OF J. E. WEAVER
(Exclusive of reviews, abstracts, year-book reports, etc.)

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$5.00

DR. JOHN E. WEAVER, professor emeritus at the University of Nebraska, is a man internationally known and respected for his work in the field of plant ecology. During the past 40 years he has authored or co-authored some 80 articles, 4 monographs, and 11 books. So valuable are his authoritative studies of root activities, drought, and the structure of grassland, that for 27 years he has been listed by *American Men of Science* as one of the nation's 100 outstanding botanists.

His professional experience includes 8 years as research associate for the Carnegie Institution of Washington, 10 years on the editorial board of the scientific journal *Ecology*, and 10 years on the National Research Council's committee on the ecology of grasslands of North America. He has been president of the Nebraska Academy of Sciences and the Ecological Society of America, and an honorary president of the 1950 International Botanical Congress.

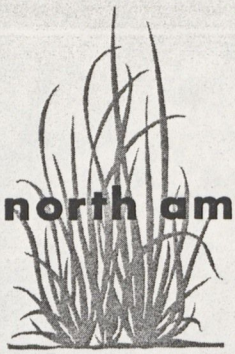
Dr. Weaver has influenced the field of ecology not only through his own publications but also through his work as a teacher at Washington State College, the University of Minnesota, and (for 38 years) the University of Nebraska. Students from all over the United States and many foreign countries have come to Nebraska expressly to work under Dr. Weaver's tutelage. He has supervised about 40 doctoral dissertations, all of which have been published.

The present publication represents, indeed, the very peak of Dr. Weaver's achievement, for it distills the results of a lifetime's uninterrupted, laborious field research.

Dr. L. A. Stoddard, of Utah State Agricultural College, in reviewing an earlier work by Dr. Weaver, wrote:

There comes occasionally to every scientific field a man who is so enthusiastic, and so devoted to his work that it becomes his very life. To him nature seems to unfold her secrets in response to his devotion; his ability to understand and communicate with nature becomes an inspiration to students and fellow workers alike. Such a man is John Ernest Weaver in the field of American grassland ecology.

JOHNSEN PUBLISHING COMPANY
LINCOLN **NEBRASKA**



north american prairie

J. E. WEAVER

TO MOST AMERICANS, the word "Prairie" suggests either a romantic element in pioneer fiction or a vast expanse of level land which must be crossed in going from one coast to another. But to the botanist, the American Prairie is a wonderfully complex society of living organisms.

This book tells the story of that society—the variety of its inhabitants; the constitution of its several communities; the internal struggles for domination of the society; and the battles of the Prairie as a whole against its two most vicious enemies, drought and overgrazing. Most striking, perhaps, is the story of that portion of Prairie which is seldom seen—the extensive and intricate "Prairie underground," with roots occasionally extending over 20 feet deep.

The information presented here is the product of long and painstaking scientific research; yet it is conveyed in terms that the general reader can understand, and it is made vivid by some 200 excellent illustrations. The expert on grasses will find here scientific data never before made available; the cattleman will acquire practical advice on how best to utilize the prairie grasses; and the layman will enjoy that rare experience of discovering a new world filled with life and struggle.

This is the first comprehensive book ever written about American Prairie. And it comes from the pen of the one man who, more than any other, is qualified by training and experience to write it—Dr. John E. Weaver. (*See back flap.*)

JOHNSEN PUBLISHING COMPANY
LINCOLN **NEBRASKA**

Department of Botany
Rutgers University
New Brunswick, N. J.
December 12, 1955

Dr. J. E. Weaver
Department of Botany
University of Nebraska
Lincoln, Nebraska

Dear Dr. Weaver:

I am a graduate student in Botany (Ecology) at Rutgers University studying under Dr. Murray F. Buell. In a current series of monthly ecology seminars we are presenting prominent contemporary ecologists. For these seminars one student chooses the ecologist he wishes to present his seminar on, gives a short biography of that person, reviews or read reviews of some of the person's better known works, and gives out a complete bibliography of the ecologist's works and writings. The purpose of these seminars is to acquaint the graduate students and the faculty members who attend with the life and works of some of the prominent ecologists in this country.

I selected your name as the person I wished to present. It would help me a great deal if you would answer a few questions concerning your life and your career as a botanist and ecologist:

(1) How did you become interested in ecology or how did you start working in the field of plant ecology?

(2) What do you consider your major contribution or contributions to plant ecology?

(3) What advice would you give a present graduate student in ecology concerning what types of courses he should take while at college and concerning practical experience during and immediately after college?

Also I would appreciate it if you would furnish me with a short autobiography of your life, a bibliography of your writings to date if you have one available, and reprints of some of your more recent papers if you have any for distribution.

All of the things I have asked for will help me present an accurate seminar on your life. I will greatly appreciate any answer to any of the questions I have asked or for any of the material I requested.

Sincerely yours,

William A. Laycock

William A. Laycock

UNIVERSITY OF SASKATCHEWAN

SASKATOON, CANADA

January 19, 1956.

DEPARTMENT OF PLANT ECOLOGY

Mr. William Laycock
Department of Botany
Rutgers University
New Brunswick, N. J.

Dear Mr. Laycock:

I have yours of the 13th instant concerning information about Dr. Weaver.

Dr. Weaver is in my opinion a very good teacher. He certainly inspired his students by the logical way in which he was able to present the principles of Plant Ecology. You probably know that the majority of the students who were enrolled in his classes were not botanists but were men majoring in other fields, particularly in agronomy. In fact many students stated that they came to Nebraska to do graduate work in agronomy so that they could take Dr. Weaver's courses in their minor fields. His courses were so distinctive as to win the nickname of "Weaverology".

Dr. Weaver's influence on my career must have been great. Before going to Nebraska I was already interested in grassland ecology, but if he had not been there I do not see how I would have persued this specialty as far as I have. This in turn has undoubtedly affected the careers of others since graduate study in grassland ecology is only possible in two locations in the British Empire. Accordingly, we have had students come from England to study here. Since I begun work here in 1948 approximately seven people have mastered under me and four of these are now in various stages of their Ph.D. work elsewhere.

In conclusion I would like to emphasize that Dr. Weaver's students in general must have thought very well of him since they have been very loyal. You may have heard that a year or two ago a reunion was held at Omaha, Nebraska, at which Dr. Weaver was honoured at a luncheon. Also, concerning the matter of the appointment of his successor several years ago, his students got together in an endeavour to insure that the Nebraska School of Ecology would continue on its previous basis after Dr. Weaver's retirement. The general consensus of opinion among his students is that this matter has been lost. I notice that you also requested information as to his most important contributionsto ecology. These undoubtedly were his masterful recordings of the grassland conditions in the Great Plains and his root studies. I would place high on the list of his work the book which he published on the True Prairie last year and the one on the Mixed Prairie which is about to be released.

Yours very truly,

R. T. Coupland
Associate Professor
Head of Department

RTC/rs

UNIVERSITY OF SASKATCHEWAN

Department of Plant Ecology

Saskatoon, Canada
Jan. 19, 1956

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Rutgers University
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R. T. Coupland /s

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Associate Professor
Head of Department

RTC/rs

UNIVERSITY OF MINNESOTA
DULTH BRANCH
Duluth 5

Office of the Provost

Jan. 21, 1956

Dear William:

Since today is Saturday, I think it is very fitting for me to do my assignment in ecology. As a Provost I have no time for such pleasures during the week.

If you haven't checked on Stoddart's statement re. J. E. Weaver in Ecology you should do so. I think it was in connection with the 1938 edition of his text.

I assume from your letter you have some of the basic data about Dr. Weaver, his bibliography, numbers of PhD's he has advised, etc. This gives you some insight to the man but does not tell you he was a master teacher in every sense of the term. It was in 1938 that I first met Dr. Weaver and not before or since have I had contact with a better teacher. To me he was able to cut out the extras and point out to the busy graduate student what was really important. He certainly could relate ecology to practical everyday living. Many of Dr. Clements' basic ideas were made meaningful by Dr. Weaver.

Dr. Weaver is a rare combination of the teacher, the researcher, and a true friend of students. He always worked hard and expected his students to do likewise. There has been no let up on his part since retirement,- I saw him last November and found him hard at work preparing manuscript for a new book.

As you might guess, Dr. Weaver has had a marked influence on me and I can think of no one, other than my own parents, to whom I am more indebted. He has never felt right about my having gotten caught up in administration and probably still thinks teaching and research should be my lot, both of which I thoroughly enjoyed.

To me Dr. Weaver's major contrubitons are many. Certainly, the teachers and research men he has produced are foremost, but his contribution to basic understanding of grassland ecology and soil-root relations will always rank very high. Bringing together many loose ends in his text was a major contribution.

If you have not contacted Dr. F.W. Albertson, Fort Hays Kansas State College at Hays, Kansas you should do so. He has probably as keen an insight of Dr. Weaver as anyone living today.

Give my regards to Dr. Buell and tell him I envy any fellow who has a seminar in ecology.

Sincerely,

R. W. Darland /s

REVIEW OF "NORTH AMERICAN PRAIRIE" by J. E. Weaver
(Review by Helvin S. Morris, Jour. Range Management 8:34)

This book is a comprehensive summary of some 40 years of study of the North American Prairie by the author, his students, and other workers in the field of plant ecology. It is designed to tell the story of the Prairie to the layman and the technician alike.

As a synthesis of some 205 citations and Dr. Weaver's interpretation of the Prairie as a complex society of living organisms, the book is organized to this end. The opening chapter on the nature of grasslands and grasses sets the back-ground for understanding the Prairie. Next, plant species and communities are described in detail. Herbaceous plants are treated as important members of the community.

Descriptions of roots and other underground parts of various species are well done, as one would expect from Dr. Weaver, who has been long known as the outstanding student of underground parts of plants. The rate of root development, extent of root development and longevity of roots of prairie species are considered important in the maintenance of the prairie as a closed community. The seasonal aspect of the prairie is described in a personal and intimate way which reveals the beauty of the prairie. It is almost subjective.

The stability of the prairie is indicated as an equilibrium which allows for some variation but which is self contained as to its species. The longevity of dominants, their control of light and water, their effects on temperature and humidity of the immediate environment, together with their capacity to adjust to the climate and biota, are the major elements of this stability.

Considerable space is devoted to reports of historical observations. For example, in early Illinois and Kansas big bluestem made such growth that a rider had to stand in the stirrups to see over the prairie. Range technicians concerned with brush control will be interested in the studies on the prairies inclusions and the forest border.

The chapters on the great drought of the nineteen thirties is an exhaustive record. The impact of an extreme environmental condition-the drought-and its subsequent effect on species and communities reveals the strength and capacity of the prairie to adjust to severe conditions.

The process of degeneration and regeneration of the prairie completes the story of the prairie. Plowing has destroyed a major portion of the Prairie with little chance of its recovery because of economic demands. Excessive grazing has caused the prairie to give way to Kentucky Bluegrass and much of the sod is no longer prairie but pasture. Fire due to lightening or started by Indians is considered a natural factor of the environment. Annual fll burning for pasture improvement, a common practice after settlement, is considered a contributing factor in the degeneration of the prairie.

The rancher and technician alike will both find this book enjoyable and informative reading. The excellent illustrations, particularly of the herbs, will appeal to the layman. The book will become a frequent reference for those who deal with the prairie. As a record of a major plant community it will be a landmark in the field of plant ecology and a standard on plant community analysis for years to come. It could have been written only by a man who devoted a lifetime to intimate living with the prairie. -- Helvin S. Morris, School of Forestry, University of Montana, Missoula.

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rank very high. Pinning together many loose ends in his text was a major contribution.

Confidentially, Dr. Weaver has been deeply concerned over the shortsightedness on the part of the University of Nebraska administration in letting the place of ecology slip since his retirement. The program was a part of his life and it is understandable how this has made him somewhat bitter. Even during his most productive years, with many graduate students to advise, his monetary support was very slim from the University. Grants from non-university sources were of some help but never large.

If you have not contacted Dr. F. W. Albertson, Fort Hays Kansas State College at Hays, Kansas you should do so. He has probably as keen an insight of Dr. Weaver as anyone living today.

Give my regards to Dr. Buell and tell him I envy any fellow who has a seminar in ecology.

Sincerely,
R. W. Dartland

Went

Frits W. Went
California Institute of Technology,
University of Nevada, Reno

Biography and Bibliography of Dr. F. W. Went

F. W. Went, son of Dr. P. A. F. C. Went, the well-known Dutch professor of Botany at the University of Utrecht, was born in 1903. As a boy, in his youth he lived next to the Botanical Garden of the Botanical Institute of the University, in constant contact with plants and botanists, and this stimulating environment induced him to become a botanist himself. After receiving his Ph.D. degree at the University of Utrecht in 1927, on a thesis describing the role of the growth hormone in the Avena seedling, he went to Java, where he was connected with the famous Botanical Gardens at Buitenzorg (Bogor) for 5 years. In 1933 he went to the California Institute of Technology at Pasadena, where he is Professor of Plant Physiology. During his early years in California he worked on hormonal control of plant growth, as well as on root formation and other auxin-affected phenomena, but his research interests gradually turned to environmental influences on plant growth. The results of over 15 years of work in this field are summarized in the volume "Experimental Control of Plant Growth," Chronica Botanica Company, Waltham, Mass., 1957. His other botanical interests lie in the fields of Ecology, especially of the tropical forest and the desert, and Evolution, which developed in the course of rather extensive travels all over the world. His interests in Botanical Gardens are still evident as a member of the Board of Governors of the Los Angeles State and County Arboretum. He has lectured on his work in different parts of the world (twice as national Stone Xi lecturer). Honorary doctor at the Université de Paris, member of the National Academy of Science. Correspondent of the Koninklijke Nederlandse Akademie van Wetenschappen, Amsterdam, and of the Académie des Sciences, Paris. Author (with K.V. Thimann) of "Hormones in Plant Growth" (New York: MacMillan, 1937)," supplied by Dr. Went.

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Wherry

Edgar T. Wherry
University of Pennsylvania

November 9, 1957

Dear Mr. Pearson:

As I have now retired, it is not unresonable for me to be asked as to my career, and I will answer your specific questions.

I was born September 10, 1885 in a row house in the northern part of Philadelphia. My father was in the printing and publishing business, but made only a modest living. I proved to be introvert and studious, so my parents decided to try to make me a scholar orscientist rather than a business man. At the age of 11 they took me to the Wagner Free institute of Science, near which we lived, to hear the free lectures on several technical fields. These included biology, chemistry, physics and geology. The ones that interested me most were those on chemistry, as presented by Dr. Henry Leffman, an important consulting chemist of the day. So I decided to go into chemistry.

Not doing well in public school, I was sent to Friends Central School, then at 15th and Race St., and graduated near the head of my class in 1902. This record enabled me to obtain a 4-year scholarship at the University of Pennsylvania, where I received the degree of B.S. in Chemistry in 1906. In my earliest readings in general chemistry books I was especially fascinated by the notes on crystals, so by way of outdoor activity I started to collect crystallized minerals. The Academy of Natural Scciences of Philadelphia was holding field trips to study the mineralogy and geology of the Phila, region, and on those trips I learned where to search for items of interest. I at the same time joined what was then the Phila. Mineralogical Club (now "Society") and on their trips got further guidance.

I soon began to discover new occurrences on my own, and my reports on these attracted the attention of Prof. Florence Bascom of Bryn Mawr College, and she invited me to become her field assistant in mapping the geology of several quadrangles in southeastern Pennsylvania. She had studied crystallography for a time with Prof. Victor Goldschmidt, at Heidelberg, Germany, and encouraged me to go there for a summer, which was most satisfactory.

To gain income I worked for a time as a chemical analyst, but was becoming so much more interested in mineralogical and geological matters that when I received scholarships and fellowships for graduate work at the University of Pennsylvania, I majored in mineralogy, receiving my PhD in 1909. During my later years of this work I was offered a position teaching ineralogy at Lehigh University, Bethlehem, Pa., where I remained until 1913. In that year I was offered a position as Assistant Curator of Mineralogy at the U.S. National Museum, so moved to Washington, D.C.

There being very little of mineralogical interest around Washington, I considered some other sort of outdoor activity, and on building a house in the suburb of Chevy Chase, I decided to try growing wild flowers in the adjacent garden land. Various naturalists whom I met gave me help in locating interesting occurrences of native plants. Soon I became aware that each species or group occupied a more or less individual geological setting, and this aroused my interest in soils.

The newer books on analytical chemistry of the day were pointing out the significance of a then new field of hydrogen-ion concentration in connection with methods, so I started work on this line. Fortunately, scientists in the Department of Agriculture were synthesizing new dyes suitable for hydrogen-ion determination, and I found I could use these to study soils in the field, which was duly published and made widely known (so that today this method is commonplace).

In my research work at the National Museum I became proficient in the then new methods of determining crystals under the microscope by the

"immersion method." One day a representative of the Bureau of Chemistry of the U.S. Department of Agriculture came to call, and offered me a position in that Bureau, to apply these microscopic methods to the identification of drugs and other non-mineralogical crystals, then an almost untouched field. It was necessary to create a title for this position, so I became a Government Crystallographer, the first and perhaps only person ever to have such a title. I was rapidly promoted to the highest non-administrative level of Principal Scientist.

One day I was asked to go to Perry County, Pennsylvania, to investigate a case of summer crystallization of honey. In preparation, I went through the report on the geology of Perry County published by the 2nd Pa. Geological Survey, and found in it a list of the plants of the county, one of them a curiously rare huchleberry. As my wild flower garden was by now flourishing, I naturally wished to get some of this plant to grow, and was fortunate in finding local persons who could guide me there. As I had by now learned to place acid-soil plants in acid soil beds, this thrived for me.

Then one day Dr. Paul Bartsch of the U.S. National Museum who also had a wild foower garden came to look mine over, and I gave him a clump of this Huckleberry (Gaylussacia brachycera). Dr. Frederick V. Coville, then botanist of the U.S.D.A., chanced to visit Bartsch's garden and expressed his great surprise at this plant being there. I had been entirely ignorant of the situation in this respect, but here was the story: Coville was embarking on his project of improving the blueberry, (now such a great success, especially to southern N.J. farmers) and wished to get living plants of all the rare species of that and related genera. There were a couple of hundred botanists around the U.S.D.A., but not one of them could tell him where to find this plant. He finally did locate it through Harlan P. Kelsey, the famous nurseryman; and now met Coville, and when he found that I had done research work on acid soils, which were proving so significant in his blueberry culture work, he invited me to collaborate with him, which worked out well.

The box huckleberry then known in Perry county, Pa., was a single clone, covering 8 acres, therefore many thousands of years old: but being all the same protoplasm, it was essentially sterile to its own pollen, so that viable seeds could scarely be produced. The species had also been reported in Delaware, but the colony was "lost". Coville had sent Ivar Tidestrom of the Dept. of Agriculture but he failed to rediscover it. So he asked me to go, and I did succeed in finding it. I carried pollen from my Pa. plant to the stigmas of a Delaware plant, and got 4 healthy seeds which produced adult plants, the first in history. After this Coville arranged to send me on trips oo amny places, getting data as to soil acidity relations of rare plants, and so I became an ecologist.

As to my ideas of plant ecology today, I will have to say that I feel that the searching for theoretical climazes and especially monoclimaxes is a great waste of effort. The Monoclimax theory holds that the climate is everything, and given time the plant communities in each area of a definite climate will be the same. To me, the Earth's surface is a vast mosaic, with the micro-environment differing from place to place. The vegetation which results is controlled by both soil chemistry and climate, and the outcome is polyclimaxes of almost infinite variability.

My background of information as to geology and corresponding soil chemistry has I feel been of great help in what teaching of ecology I have done. In all my courses in botany I have continually given illustrated lectures showing the plants of various regions, which presumabley gave the classes a broader viewpoint than they get in the usual microscope- biological courses.

Coming now to botany, as I recall, the lectures on this at the Wagner Free Institute of Science did not interest me at the age of 11 at all.

I did grow a few plants from seeds on a windowsill, and learned some horticultural names. In Friends Central School I took a course in botany, in which the instructor brought in some spring flowers for the class to dissect and identify, and I for no particular reason was especially interested in Polemonium reptans. Some years later the amateur naturalists of the Academy of Natural Sciences pointed out to me another member of this p lant family, Phlox subulata, as growing on serpentine rocks in southeastern Pennsylvania. Still later I was looking for ferns on a cliff in Kentucky, and saw a long lost plant, Phlox "stellaria" growing there. One after another these contacts got me especially interested in this particular family, so I have now written a good bit about it. There is the one book, The Genus Phlox, published 2 years ago at our Morris Arboretus. And a very time-consuming study on the Polemoniaceae of Nevada has just been issued in the series of pamphlets covering the flora of that state.

Having also done some research on ferns, it may be worth mentioning the way in which "luck" or "chance" or wh atever you wish to call it has operated here as in the fields I have already presented. In my early days of hunting up wild flowers for my garden in Washington, some naturalist whose name I do not now recall called my attention to an occurrence of Walking Fern (Camptosorus) on mica gneiss rock in a valley along the Potomac in Maryland, whereas the books said this fern grows chiefly on limestone. Before that time I did not know one fern from another, but at once started to look into this plant family. At that time Dr. William R. Maxon was the leading local fern authority, and he helped me in identifications in the U.S. National Herbarium, and I ultimately got to search out rare ferns in many parts of the U.S. Some of them are good indicators of acid or of circumneutral soils. In time I was elected President of the American Fern Society, which at the time was "broke" in that its treasurer had appropriated its funds, but with the aid of two New England members, Ware and Weatherby, it was possible to reorganize the Society and get it going again.

It is hard to believe, but I also helped the American Rock Garden Society. They did not have a publication of their own, and interest was lagging. So some one asked if I would found a magazine for them, which I did and continued to edit it for 5 years, by which time the Society was in thriving condition and has continued to grow since.

Last Tuesday I was happy to be able to attend a special celebration of the Mineralogical Society of America at Atlantic City. I had been one of the committee of 6 mineralogists who founded this society 40years ago, and I had edited the American Mineralogist as their officail publication for 2 years. Then I had turned it over to Prof. W.F. Hunt of the University of Michigan, who edited it for 35 years during which time it increased in size vastly. Because of advancing age he recently retired, so the Society was awarding him a medal for all he did for their success.

So you see I have been a scientific pioneer in a wide variety of fields, and have found great satisfaction in being able to start off these projects and then have others carry them through.

Edgar T. Wherry
(signed)

A Partial Listing of Papers by E.T. Wherry

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1948 Wild Flower Guide of New England and Midland United States.

1955 The Genus Phlox.

Whittaker

Robert H. Whittaker
Cornell University

BROOKLYN COLLEGE
Bedford Avenue & Avenue H, Brooklyn 10, N.Y.

Department of Biology

December 20, 1957

Mr. John W. Andresen
Department of Forestry
Rutgers University
New Brunswick, New Jersey

Dear John:

I don't know quite what is pertinent to the sort of seminar you are giving with Dr. Buell; but here are some comments on my background and viewpoints, along the lines you ask. I came from Kansas, originally, from a small town (Eureka, population about 3500); and went through college not so far from there, at Washburn College, now Washburn Municipal University, Topeka, Kansas. I had a long background of interest in nature and the out-of-doors as a boy, hiking over the mountains in Colorado in the summer, the prairie-covered Flint Hills on the edge of which Eureka was situated, when in Kansas. My father had been a zoology professor, so that I got some encouragement in the direction of natural history. By the time I got to college my interest in biology was strong, and the professional choice in this field natural. I had pretty well settled on ecology as a field of specialization while an undergraduate. The real reason for this choice, over other work which would have involved research in the field, I really do not know; and probably few people really know the reasons for such choices when it is not the influence of a particular individual that is responsible. The choice is often made, I think, and perhaps best made, by a kind of intuitive process in which one feels one's way toward a field the whole character of which is such that one can feel a kind of sympathetic interest in it and which one feels, by one's intuitive assessment of one's own, as yet undeveloped potentialities, that this is a field that matches the character of one's talents in such a way as to be a suitable arena for original contribution. The process is, I think, even when one does not speak of one's field as one's "love," a process akin to the choice of a friend or lover, an intuitive evaluation of match or mutual compatibility which is only partly conscious and logical, largely unconscious and unverbalized; and I suspect that success in one's field, like success of a marriage, may depend in part on the extent to which this intuitive sensing of mutual appropriateness has operated properly, and overruled the arguments from logic and other people's opinions that tend to divert one. Anyway, I consider myself fortunate in my own choice of field.

During the war I spent 3½ years in the Air Forces, ending up as a weather forecaster because meteorology seemed to have the most relation to my interests of the kinds of work available. I was also studying ecology then through some of the books available--I had never had a course in it--notably Weaver and Clements, and Clements and Shelford. The latter, rather awful book was not enough to discourage me; perhpas it suggested the need in the field for those who could deal more effectively with concepts and theory, without confusing these with terminological froth. Anyway, within a few days after I got out of uniform I was enrolled as a graduate student in ecology at the University of Illinois, starting my work with the better-known animal ecologist there, V. E. Shelford, but dividing my interests between animal and plant ecology. It was a stimulating situation for some of us. Shelford and Kendeigh there at that time teaching Clementsian ecology in rather pure culture as the very basis of ecological understanding; disagreements with it, and the existence of other important schools in Europe, were hardly dwelt upon, when mentioned (Kendeigh is by no means so orthodox now as Shelford was then). Not far away there was the plant ecologist, A. G. Vestal, who was a sceptic in the true sense, not of

simple disbelief, but of constant, unrelenting questioning, of scrutiny of that which others preferred to take for granted, exposing the inadequate bases of ideas which others were willing to accept as the foundations of the field. Vestal did not simply teach a viewpoint or doctrine; he quietly needled students into re-examining their own ideas without asserting his own position. The majority of students who wanted comfortable, ready-made, unthinking answers went away puzzled and little influenced by Vestal; but some of us also were considerably stimulated toward thinking about ecological concepts and assumptions, for some of us Vestal was a valued friend and a valuable counter-balance to the simpler kind of teaching offered by Shelford. I don't know how much to say I owe to Vestal. I am still inquiring into concepts as effectively as I can, but I always wanted to do that anyway. I am effectively identified now with the "individualistic" or Gleasonian wing of the field, as is Vestal, but this I did not simply learn from him. He had forced me to recognize by his kind of needling, during my first year in graduate school, that the basis of accepted ideas on associations and other community-units was wholly inadequate. I went into the Great Smoky Mountains for my thesis work with the idea that through unbiased sampling of the plant and animal communities, unprejudiced by any assumptions about plant associations, one could not only demonstrate that these were "real" units inherent in the structure of vegetation, but could show which of the possible approaches was best in its correspondence to the real units. My initial idea, ironically, was scientific establishment of the idea of plant associations, not its repudiation. The whole project proved to be a great, but extremely productive miscalculation. By the time I was through analyzing population distributions and observing the actual continuities I encountered, I was forced into acceptance--at first reluctantly--of Gleason's position. When this time came I found myself also in agreement with much of what Vestal had suggested to me and other students, and using the kind of scepticism he represented as a means of clarifying problems and clearing the way toward newer, and one hoped more soundly based, contributions to concept-formation and theory.

I think the character of my research and interests is well shown by my publications. The kind of research I have done is rather varied. It includes two extensive, monographic, analyses of mountain vegetation, one in the Great Smoky Mountains and the other, which is now in manuscript, in the Siskiyou Mountains of southwestern Oregon and northwestern California. These, of course, are based on the "gradient analysis" approach which I developed in the Smokies work--although various others have done something related to this, and Curtis was developing the same approach independently at the same time as my smokies work. I have been involved also with two rather extensive studies of terrestrial insect communities--one the work in the Great Smoky Mountains, the other a study of the seasonal flow of insect populations in a sage-brush semi-desert community, which is not ready for publication yet. Also, I carried out, with a graduate student, a study of the copepod communities in saline water bodies of the Columbia Basin, in semi-arid southeastern Washington, which is appearing in the January ECOLOGY: and at the Hanford Works, the great plutonium factory in Washington, which has an extensive research laboratory of radiation biology, I did a series of experiments on the movement and concentration of radiophosphorus in aquarium and pond ecosystems that I am now preparing for publication. This work and my theoretical publications have a common theme--the study of natural communities, whether aquatic or terrestrial, whether primarily through plants or animals. I regard myself as a synecologist, a specialist in the study of natural communities; beyond that my primary interest is that of a theorist, concerned with the concepts and the theoretical structure by which the raw data of a field are given meaning and subjected to comprehension, by which the field itself becomes effective and productive. I do not generally undertake research that does not seem to have some likelihood of contributing to the understanding of natural communities in general, as distinguished from detailed knowledge of

facts about this community or that. My primary interest is in the theory or understanding of natural communities; but I also consider not only that theory to be good must grow from research, but that the individual theorist must almost always have direct and extensive experience in the concrete problems and hard work of research in his field if his theoretical contribution is to be really relevant and effective.

My viewpoint on the present status of phytoecology and where it is going may be something of a minority position. I am, for one thing, regarded as a member of the individualist wing, and a strong emphasis of this position is not a sure way to popularity, though it is no longer regarded as an unrespectable position. For another, I have read or scanned some thousands of ecological papers of many countries and languages in the past few years, in connection with my monographs on climax theory and the classification of natural communities. I have,to some extent, sought intentionally to move from an American toward an international perspective on the field. And when I attempt to view American plant ecology from such a perspective, the view is not always, in all respects, a gratifying one. One of the comments I would make is on the lack of really searching inquiry into theory, of conceptual ferment in the field in the past. There has been a sort of monoclimax-polyclimax controversy, and a movement away from the ideas of Clements; but there was rather little, I think, of real probing into fundamentals. For another thing, closely related to this, there was rather limited interest in what was going on abroad; American ecological thinking remained to a degree local and endemic to North America. (This is not a special criticism of American ecology, for the same was true of other schools). In this context the various writings of S. A. Cain gained him a reputation for both unorthodoxy and international viewpoint when the real effectiveness of those writings, in the context in which they appeared was limited. Viewing the field as a whole, with allowance for the fact that any such sweeping characterization must be partly unjust, I get the impression of a kind of complacency, a satisfaction with American ecology as it was regardless of what happened abroad, with detailed or factual research problems that added little to general understanding, with polite discussion of concepts and theory that was not very effective, with avoidance by concensus of the disturbing questions that Gleason had raised; and, as the other side of this complacency, a lack of that ferment of ideas, that feel for science as a challenging intellectual adventure into the unknown, toward the creation of human understanding, without which a science may not simply stagnate, but will not progress rapidly or far. There was a time, in the heyday of Clements, when American ecology had a position of real leadership in the world picture of our field. But Clements is a declining influence now; and I do not think one can now say that America has world leadership in ecology--this leadership is at present centered in western Europe. And I would not be too surprised to see Russia, more than the United States, emerge into a position of leadership some years from now. Underlying that possibility, along with the real prospect that the Russians may surpass and defeat us, is a recent American failing that is of increasing danger to us, our neglect of that which is genuine, difficult, and important, in favor of that which is easy, popular, and profitable. And I think this broader national limitation is not wholly without its bearing on American plant ecology.

For the future of American plant ecology, I do not think we should try to compete with the Europeans in their own direction, based on systematic classification of vegetation. There are, I think, certain directions or kinds of research that hold much promise for the future. One of these is continuing, exacting, and to the extent necessary upsetting, inquiry into concepts and their bases and, with this, the attempt to keep the conceptual development of the field active enough to provide continuing stimulation to field work that is likely to be productive. Another is an eclectic view of the contributions of the many schools of ecology, escaping unquestioning commitment to American viewpoints in

favor of knowledge of the many approaches tried elsewhere, which will sometimes be more productive ways of doing things in a given research problem than our own, more familiar ways. Third, is the further development of statistical and other quantiative, ecology. This is something in which the British and Americans have present leadership, but I think many of the fair number of American papers on statistical ecology lack real effectiveness,and our work in this, taken all together, somehow does not seem to me to add up to anything as significant as it might. In part I think this goes back to the matter of concepts and theory--we do not yet have as clear ideas as we might on the kinds of questions we can best approach statistically. Fourth, there is the more effective treatment of plant communities in an ecosystemic context, and consideration of their metabolic and productivity relations. Productivity relations underlie a great deal of what the ecologist studies; but most of what has been done in this fundamental area of research has been done by limnologists and animal ecologists, not plant ecologists. There are two other kinds of research I would mention. One concerns the reasons for the population distributions of species in the field, what underlies the bell-shaped and other types of curves that appear in gradient analysis, a very difficult kind of research involving genecology as well as population dynamics, autecology, and community interrelations. The other is the approach to productivity and other relations of whole patterns of vegetation--as of mountain ranges, watersheds, and managed ranges. And, in relation to the ecosystemic context, I think there is much to be gained from further study of plant communities not by themselves, but in connection with other aspects of ecosystems--soils, animals, and saprobes or reducers; but this need is a familiar one.

I hope these comments will help, when you are doing me the compliment of discussing my work. Merry Christmas to you and your family.

Yours sincerely
(signed -- Bob)

R. H. Whittaker

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1952. A study of summer foliage insect communities in the Great Smoky Mountains. Ecological Monographs 22:1-44.

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Wolfe, John N.

John N. Wolfe
Ohio State University

SEMINAR ON CONTEMPORARY ECOLOGISTS

By Phil Pearson

Life and Works of John N. Wolfe

Brief biography from American Men of Science

Born: December 2, 1910 at Logan Ohio.
Married in 1935; has two children.

Education: BA from Ohio State in 1933
MS " " " " 1934
Phd " " " " 1937

Career: Instructor in Botany, Ohio State University, 1937-1943
Assistant Professor, " " " , 1943-1947
Associate Professor, " " " , 1948-1953
Professor , " " " , 1954-

Chief of Environmental Sciences Branch, U.S. Atomic Energy Commission 1955-

Fellow of Ohio Academy of Microclimatology

Associate Editor of Ecological Monographs 1953-1955

Societies: Botanical Society
Ecological Society
American Geographical Society

Interests: Plant Ecology (microclimatology)
Ohio Flora

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_____ 1948 (?) A catalog of the lichens of Ohio. Ohio Biological Survey Bull. # 36.

Woodbury

Angus M. Woodbury
University of Utah

A BRIEF BIOGRAPHY OF ANGUS M. WOODBURY

(Note: The following account has been compiled largely from materials provided by Dr. Woodbury.)

"Angus M. Woodbury was born July 11, 1886 at St George , Utah. His father, John Taylor Woodbury, of Yankee and English parentage, born at the same place January 30, 1863 was among the first pioneer children born in St George after its settlement in December 1861. His recollections of early pioneer life in Utah's Dixie were later (1933) published under the title "Vermilion Cliffs, Reminiscences of Utah's Dixie." His mother, Mary Evans of Welsh-English extraction was born February 2, 1862 at Rowington, Warwichshire, England, but came to Utah as a baby.

Angus was the second of nine children, not a large family of a rural community in those semi-pioneer days. The father was a school teacher for twenty-four years, but also had a farm and a pure-bred herd of Jersey cattle in later years. He held a degree of Bachelor of Didactics and a professorship of Natural Science in the Mormon Church School Service. He taught school in the Latter-day Saints College at Salt Lake City from 1892 to 1896 and then moved back to St. George to spend the rest of his life.

Angus spent his first four years of school (1892-96) in the grade schools of Salt Lake City while his father was teaching at the L.D.S. College. The next six years of schooling were obtained in St. George. Two years of study at the Brigham Young University at Provo enabled him to graduate from high school in 1906, which was at that time, locally considered a good education.

Four summers of surveying work in the Unita Basin and in the Zion Park region between 1903 and 1908 gave him field experience that developed him into a seasoned mountaineer. In October 1908 he joined the U.S. National Forest Service as a result of Civil Service examination taken the previous spring.

A romance which started in June 1907, culminated on January 15, 1909 when he married Grace Atkin, vivacious red-headed grand daughter of the St. George pioneer wit and poet Charles L. Walker. She was destined to share many of the interesting experiences of her husband, to be the mother of six children, and to be a wit, writer, planner, and helper with local programs wherever she went.

He spent about twelve years (1908-1920) with the Forest Service in various capacities from Assistant Ranger to Deputy Supervisor and with many kinds of activities such as grazing livestock, timber cutting, surveying, mapping, watershed protection, reconnaissance, wildlife studies, and land classification. Here he became deeply interested in nature, forests, and wildlife. Not only did his mountaineering experiences increase, but he also learned to make accurate reports on almost everything that came within his field. He spent the witnter of 1913-14 in college at the University of Utah. At one time, he started as a private hobby a project that was never completed, a treatise of native trees of Utah, having been brought to a halt by his change in occupation.

Soon after the World War (1920) when farmers were doing so well, he took over his farther's pure-bred Jersey farm at St. George. He had hardly got settled, however, when the 1921 depression deflated prices until it was no longer profitable. He yearned for a more mentally active life than the farm work provided and during the winters of the next few years, took some courses at the Dixie College at St. George, specializing in Entomology and making a private collection of insects.

As a result of his studies, he was appointed inspector for the Utah State Board of Agriculture in the Southwestern Utah district, but when naturalist work was introduced into Zion National Park, he was appointed the first naturalist there in June 1925. This offered an opportunity for further development in which his previous training and experiences furnished a useful foundation. During the next few summer seasons, he studied the fauna, flora, and geology of Zion Canyon intensively to get materials suitable to satisfy the wants of visitors who were flocking to the canyon in ever increasing numbers. He established a regular guided nature trip to the Narrows and regular lectures at camp ground and lodge, together with a series of outlined talks suitable for those occasions. In 1928, he established a small museum and organized an information and museum service for the public. In 1929, the memiographed Zion-Bryce Nature Notes were initiated of which he was editor for the first three volumes.

In the fall of 1925, he was engaged to teach part time at Dixie College, while pursuing his studies. During the next winter, 1926-27, he attended the B.Y.U. at Provo part time and received his Bachelor's degree in the spring. During the winter of 1927-28, he was engaged in part time teaching at the University of Utah while pursuing his studies for the Master's degree which he obtained the next spring.

It was while studying for the Master degree, that his first important work for publication was prepared, although several minor articles had previously appeared. He chose for his thesis a study of the reptiles of Utah and it was later published (1931) under that title as a bulletin of the University of Utah.

The next two years 1928-30 were spent teaching at the University of Utah while pursuing further studies toward a doctorate. On leave of absence during 1930-31, he finished his work for the coctorate at the University of California at Berkeley, and received the Ph. D. degree that spring. His major work was done in the Museum of Vertebrate Zoology. He took with him to California the imformation collected during six years of work there as naturalist and used this material to work into a thesis. It was planned to correlate the botanical, zoological and geological interrelationships of Zion Canyon in one comprehensive scheme of thinking under the title of "Biotic relationships of Zion Canyon, Utah, with special reference to succession." This was later (1933) published in Ecological Monographs (3:147-246) at Duke University and proved to be his most important paper published up to that date

After returning from California, he resumed his teaching at the University of Utah, and immediately concentrated his spare

time efforts toward building up a research museum of vertebrate animals, especially birds and reptiles. At that time, the residue left in this field from the old University Museum consisted of only a few study skins of birds with data attached and three cases of mounted specimens for display but without data and useless for research purposes. With the help of others the collections grew steadily until 1940. When Behle took over birds, they were estimated to contain specimens of 2500 bird skins, 10,000 bird eggs, and 300 bird nests. The reptile collection was equally large and consisted of over 2500 specimens.

During the summers of 1932 and 1933, he returned to Zion Canyon, where, during spare time, he prepared three manuscripts 2 of which have not yet appeared in print. During the meetings of the Western Division of the American Association for the Advancement of Science held in Salt Lake City in June 1933 in a symposium of the problems of Great Salt Lake, he delivered a paper on the animal relationships of Great Salt Lake which was published later (1936) under that title in Ecology (17:1-8). A paper given at the Utah Academy of Science in Provo, November, 1936 was later (1937) published in the Utah Educational Review (30:173-174, 200) under the title, Planning for the Conservation of Utah's Wildlife. Another symposium paper entitled, Management of Aquatic Wildlife in the Great Basin, given at the meeting of the Ecological Society of America at Denver, Colorado in June, 1937 has been published in Scientific Monthly (1940:307-322), official organ of the American Association for the Advancement of Science. Minor articles have appeared from time to time. He is now engaged (1942) with others in the preparation of a work on Utah birds.

In 1932-33, he was one of the instigators of a movement urging the proper management of our natural resources (especially wildlife) which crystallized in the formation of the Utah Natural Resources Association, of which he became secretary. As a result of the activities of this association, the secretary prepared a report on the natural resources of Utah, disseminated as type-written copies, and published about 1935 without acknowledgement of the writer in a local newspaper.

In 1937, he was invited to join the summer expeditions of the American Exploration Society in the Navaho Country in southeastern Utah and north-eastern Arizona known as the Rainbow Bridge-Monument Valley Expeditions. During the expeditions of 1937 and 1938, he acted as ornithologist and continued his studies and collections of birds. The results of the expeditions are still being compiled, but a paper on the Birds of the Navaho Country is now (1942) nearly completed. (Published 1945.)

In early 1936 at a meeting attended by John H. Baker, Executive Secretary of the National Association of Audubon Societies, Dr. Woodbury was appointed Chairman of the committee assigned the problem of organizing a Utah branch of the Audubon Society. At the organization meeting, it was found that there was found that there was already in existence an incorporated Utah Audubon Society that had been inactive for many years. This society has issued in mimeographed form many short papers on birds, lives of Utah ornithologists, field trips, and Xmas censuses at Salt Lake Ci

During the six months from June to December, 1940, he was on leave of absence studying in the East. He attended the Wisconsin University summer session and the Minnesota summer school at Lake Itasca. During September, he attended the biological symposium at Madison, Wisconsin; the bi-centennial of the University of Pennsylvania at Philadelphia and visited the U.S. Fish and Wildlife Service in Washington, D.C. He spent the fall quarter until Thanksgiving at Duke University, North Carolina and then returned to Washington, D.C., for two or three weeks. On his way home, he gave a Sigma Xi lecture at Duke University and repeated the lecture at Tulane University in New Orleans and at Texas A. and M. University at College Station, Texas.

During this trip, he prepared teaching outlines of a course in animal ecology and a paper on animal migration in which he presented the periodic response theory. This was later (1941) published in the Auk, (58:463-505).

His studies and collections of specimens include the following:

1. A collection of Washington County insects (2500-3000) left at Dixie College (1923-1927).

2. A collection of southern Utah insects brought to University of Utah Entomological Museum (1923-1931).

3. A collection of Zion Canyon insects in Zion National Park Museum (1925-1931).

4. A collection of southern Utah plant specimens, part of which were left at Dixie College, part at Zion Museum and part at University of Utah Herbarium (1925-1931).

5. A collection of southern Utah snails, divided between the Zion Museum and University of Utah (initiated under stimulus of W. A. Pilsbry).

6. A collection of Washington County spiders under stimulus of R. V. Chamberlin and brought to the University of Utah (1923-29).

7. A collection of southern Utah reptiles, some left at Dixie College, some at Zion Museum, but the majority brought to University of Utah and used as a nucleus in the preparation of his Master's thesis on the "Reptiles of Utah." (1925-27)

8. A collection of Utah reptiles from many parts of the state some from elsewhere for University of Utah Zoological Museum (1928-1942). Total museum specimens including collections of others about 2500.

9. A collection of Utah mammal skins for University of Utah Zoological Museum (1928-1932).

10. A collection of bird skins from various parts of Utah, a collection of bird eggs and a gathering of private collections into the university and a collection of about

300 bird nests. These are now in the University of Utah Zoological Museum (1931-1940).

11. A collection (1937-1938) of bird skins and nests from the Navaho Country in southeastern Utah and northeastern Arizona.

Study areas and researches include the following:

1. General ecology; General ecological studies of Zion Canyon already indicated.

2. Vertebrate ecology: General ecological studies of the great biological communities of Utah with special emphasis on vertebrate animals inhabiting each great plant belt, but also including analysis of the major plants as well (1910-1942).

3. Birds of Utah: Special emphasis on bird studies in the field, in the museumand in literature in cooperation with Dr. Clarence Cottam and Dr. J. W. Sugden in preparing a work on more than 400 birds of Utah (1931-1948).

4. Gull-banding: A special project of placing colored bands on the legs of more than 3000 young California Gulls on Egg Island in Great Salt Lake for the purpose of studying the momements, migration and life history of the birds (1939-1941).

5. Tortoise dens: A special tortoise study area on the Beaver Dam Slope in Washington County, where more than 200 Desert Tortoises have been branded so that each one can be individually identified. In Cooperation with Ross Hardy of Dixie Junior College, about fifty trips to the study area from 1936 to 1942 have yielded many recaptures of marked tortoises and much information on the habits and life history, which will serve as basic material for future papers.

6. Snake dens: A study of snake dens in Utah and Colorado (1935-1942) has culminated in establishment of a detailed study of a large den near Grantsville, Tooele County. (1940-1942). About 650 snakes have been tatooed with a number which provides individual identification for the marked snakes. The den is estimated to contain about 1500 snakes of at least 5 different species which congregate there for winter. These are recaptured from time to time and measurements recorded. Experimental removal and studies of return together with recapture data yield information on growth, movements and life history which will also serve as foundation material for future papers.

7. Taxonomy: A study of the evolutionary divergence of a race of the Rat Snake in eastern Utah and western Colorado and a description of a new subspecies (1935-1942) and formerly (1931) a dexcription of a new subspecies of rattlesnake.

During the years 1928-1942, he has taken about 150 field trips or expeditions ranging from one day to five weeks in length to many parts of Utah and surrounding states primarily for the purpose of study and collection of specimens.

He has had 3 spiders and a subspecies of mammal named in his honor, Woodburi.

He has served on the following commitees or councils in the university.

1933-36. Chairman, Committee on correlation of objectives.

1935-45 Lower Division Advisory Council.

1937-40 Student Loans

Master's thesis worked out by students in special fields with Woodbury are listed below:

Behle, Wm. H.
1932 The bird rookeries of the islands of Great Salt Lake.

Bradford, Nettie
1938 Property rights of animals.

Brown, Mary D.
1937 Factors involved in bird migration.

Cole, La Mont C.
1939 Effects of radiant energy on reptiles.

Fowlks, E. W.
1931 Anatomy of Blue Racer and Collared Lizard.

Hansen, Minnie E. S.
1936 Field characteristics of Utah non-passerine birds.

Hardy, Rose
1937 Birds of pinon and shadscale near Price, Utah.

Linford, Jean H.
1935 The life history of the Thick-billed Red-winged Blackbird.

Sanford, Mattie C.
1937 Food of English Sparrow nestlings in Salt Lake City.

Snow, Rex B.
1941 A natural history of the Lewis Woodpecker.

Walsh, O. S.
1936 Utah Passerines, field characteristics and records.

Woodbury, Marian
1938 Reproduction in the lizard, Sceloporus g. graciosus.

He is a member of the Utah Academy of Science (chairman of biological section, 1939-42), American Ornithologists Union, Cooper Club (birds), Utah Audubon Society, Western Bird Banding Association, American Society of Ichthyologists and Herpetologists (vice-president 1941-42), Ecological Society of America (member of Committee of Western Division 1937-38, 1942-43), American Association for the Advancement of Science, American Museum of Natural History, and the honor society of Sigma Xi (research). His name appears in Utah's Distinguished Personalities, Who's Who in American Education, The Naturalists Directory and American Men of Science.

His children include Lowell A., born October 11, 1910; Marian, born September 1[illegible], 1914; Max A., born April 30, 1917; Edith Rae, born June 13, 1919; Dixon M., born August 6, 1921; and J. Walter, born August [illegible], 1923.

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1927 Studies in the Sphecoidea of Utah (abstract). Proc. Utah Acad. Sci., 4:27-28

1928a The reptiles of Zion National Park. Proc. Utah Acad. Sci., 5:11-12.

1928b The reptiles of Zion National Park, Utah Copeia, 166: 14-21.

1928c The Spiders of Washington County, Utah Proc. Biol. Soc. Wash., 42:131-142.

1929b The snails of Zion National Park, Nautilus, 68:54-61.

1929d A new rattlesnake from Utah. Bull. Univ., Utah 20 (6):1-4.

1930a Insect studies of Zion National Park. Utah Ed. Rev., 23(3): 382-3, 403-4.

1930d Crotalus coufluentus concolor (Woodbury). Bull Antivenom Inst. Am., 4(1): 23.

1931a The reptiles of Utah. Bull. Univ. Utah, 21(5):1-129.

1931b The route of Jedediah S. Smith in 1826 from the Great Salt Lake, Utah Hist. Quarterly, 4:35-46. (This theory has been superseded. See Maurice Sullivan's the Travels of Jedediah Smith).

1931d A list of the common birds of Zion National Park, published as list XI on page 169 in Bird Watching in the West, by R. S. Twining. Metropolitan Press, Portland, Oregan.

1933a Biotic relationships of Zion Canyon, Utah with special reference to succession, Ecol. Monograph, 3: 147-246.

1933b The bird rookeries of Great Salt Lake. Proc. Utah Acad. Sci., 10:165. (with William H. Behle).

1933e The scratching of the Spurred Towhee. Condor, 35(2): 70.

1933f Utah Resources and Activities. Editor and contributor to Chapters on animal life and conservation. Utah State Board of Education.

1936 Animal Relationships of Great Salt Lake. Ecology, 17(1):1-8.

1937a Planning for the conservation of Utah's Wildlife. Ut. Ed. Rev., 30(4): 173-4, January - February

1937b A Brown Pelican record from Utah. Condor, 39(5):225.

1937c An evolutionary time scale. Evolution, 4:7-8.

1937d A record of Tadarida Macrotus from Utah. Journ. Mammalogy, 18(4):515.

1938a Red-naped Sapsucker and Rufous Hummingbird. Condor, 40(3):125.

1938b An hour in the life of a Broad-tailed Hummingbird. (With John W. Sugden) Condor, 40:160-162.

1938c The Lower Sonoran in southwestern Utah. Science 87: 484-485.

1939a Bird records from Utah and Arizona. Condor, 41:157-163.

1939b Observations on the breeding of the Western Chipping Sparrow. The Cologist, 56:114-116. Whole NO.629, Oct.

1939c Management of Aquatic Wildlife in the Great Basin (abstract). Proc. Utah Acad. Sci., Arts and Lett. 16:41.

1939d Reproductive cycles in the Sagebrush Lizard, Sceloporus g. graciosus, (abstract). Proc. Utah Acad. Sci., Arts and Lett. 16:65.

1940a Management of Aquatic Wild Life in the Great Basin. Scientific Monthly, April 1940:307-322.

1940b Antler-eating by rodents. Science 92:127-128 (2389).

1940c Northern Crested Lizard collected in Utah. (With Ross Hardy). Copeia, 1940:205.

1940d The dens and behavior of the Desert Tortoise. Science 92:529 (2397).

1941a (With H. N. Russell Jr.). Nesting of the Gray Flycatcher. Auk 58:28-37.

1941b Copulation in gopher snakes. Copeia 1941:54.

1941c Bird habitats of the Salt Lake Region. Audubon Mag. 43:253-263.

1941d Animal Migration -- periodic-response theory. Auk 58: 463-505.

1941e Changing the "hook-order" in cows. Ecology 22:410-411.

1942a Man's biological future. Science 95:121-122.

1942b Notes on migrations of the Painted Lady Butterfly in 1941. Pan-Pacific Ent. 18:165-176.

1942c (With Dixon M. Woodbury). Studies of the Rat Snake, Elaphe laeta, with description of a new subspecies. Biol. Soc. Wash. 55:133-142.

1942d Status of the name Crotalus concolor. Copeia 1942:258.

1944a (With Clarence Cottam). Type locality of Perisoreus canadensis capitalis Ridgway. Auk 61:131-132. January.

1944b Research on the high school level. The Nations Schools 33:47. Feb.

1944c Research is needed in high schools and colleges. Ut. Ed. Review, 37:271-273,306.

1944d My Rattlesnake Bite. Utah Acad. Sci., Arts and Lett. 19:179-184. 8/4/44.

1944e (With Mrs. J. Dwain Anderson). Report of Rattlesnake Bite of J. Dwain Anderson. Utah Acad. Sci., Arts and Lett., 19:185-188. 8/4/44.

1944f The Joshua Tree Flower as a source of Food. Utah Acad. Sci., Arts and Lett., 19:185-188. 8/4/44.

1944g Notes on Mexican snakes from Oaxaca. Jour. Wash. Acad. Sciences 34:360-373. November 15, 1944.

1945a Birds of the Navajo Country. Bull. Univ. Utah 35(14): 1-160 - Map. Biol. Series 9(1): 1-160 - Map. March 1, 1945. Mailed Mar. 17, 1945.

1945b A new Gerrhonotus lizard from Utah. Proc. Biol. Soc. Wash., Mar. 21, 1945. 58 5-10.

1945c (With Marian Woodbury). Life-History studies of the Sagebrush Lizard Sceloporus g. graciosus with special reference to cycles in reproduction. Herpetologica, 2:175-196, 1945.

1945d A history of southern Utah and its National Parks. Utah Historical Quarterly 12:109-222. 1944.

1946 Huge migratory flock of Purple Martins in Utah. Condor 48:42.

1947a Distribution of pigmy conifers in Utah and northeastern Arizona. Ecology 28:113-126.

1947b The puma, mysterious American cat. Ecology 28:328-329.

1948a Animals and salinity in the Great Basin. Amer.Nat. 82: 171-187.

1948b Marking reptiles with an electric tattooing outfit. Copeia 1948 (2):127-128.

1948c (and Ross Hardy) Studies of the desert tortoise Gopherus agassizii . Ecol. Monog. 18:145-200.

1950a (and E.W. Smart) Unusual snake records from Utah and Nevada. Herpetologica 6:45-47.

1950b (and R.M. Hanson) A snake den in Tintic Mountains, Utah. Herpetologica 6:57-77.

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A SHORT BIOGRAPHY Feb. 17, 1956

Angus M. Woodbury, Director of Ecological Research, University of Utah, was born at St. George, Utah, July 11, 1886.

St. George was an irrigated farming community. Ages 5 to 10 spent in Salt Lake City where his father was teaching school in academy and college and where he learned the ways of city life. From 11 to 16, he was back again in St. George where he grew up on farm and range, becoming acquainted with both range cattle and dairy herds. Summers from age 16 to 21 surveying in mountains of Utah; at school in winters.

Joined U.S. Forest Service at age 22 and continued until age 36 in the mountainous regions of Utah and parts of Arizona, Nevada, Idaho and Wyoming dealing with sheep and cattle on the range, land classification, land policies, raising forests and forage on the land.

Responding to an S O S from his father for help with his dairy farm, he went back home to St. George in 1920, where he engaged in farming, dairying, creamery, state agriculture inspector and census taking. In 1925, he became the pioneer naturalist in Zion National Park and continued that position during summers until 1933. In the winters 1925-27, he taught in Dixie College at St. George and then transferred to the University of Utah, where he has continued to the present time.

During those summers at Zion Canyon, he became acquainted with many people, some of ecological stature, e.g. Henry W. Cowles, John W. Harshberger, A. C. Kinsey and many others. He worked intimately with Dr. Herbert E. Gregory, spare time geogist and geographer of southern Utah, who was at that time Chairman of the International Commission for study of the Pacific with headquarters at the Bishop Museum in Honolulu and who spent his summers in Southern Utah in order to keep up-to-date in his field. When a tour of members of the International congress of geologists visited the region, Gregory prepared the agenda for the trip but he selected Woodbury to guide the party on the tour of Zion, Grand Canyon (north rim), Bryce Canyon and Cedar Breaks and explain the geological features along the way.

From his youth onward, he had been associated with the outdoors and was well versed in the ways of nature from mountain forests to desert plains when, as naturalist he began systematic collections of living things in Zion Canyon. Five Summers of such collections and five winters of intensive study of the collections prepared him to go to Berkeley to get his Ph.D. at the University of California under the friendly guidances of Joseph Grinnell. Here, he made his first major ecological contribution in his thesis dealing with the Biotic Relationships of Zion Canyon, a study of the geological, botanical and zoological interrelationships, later published in Ecological Monographs (April 1933).

He had previously published his masters thesis, The Reptiles of Utah, as a bulletin of the University of Utah. After obtaining his doctorate, he embarked upon a long-time project of building a zoological museum of Utah terrestrial vertebrates. He concentrated principally upon birds but also continued his interest in reptile collections and later their field ecology.

He continued intensive work with Utah birds from 1932 to 1948, during which time, in collaboration with Drs. Clarence Cottam and John W. Sugden, they produced a 1500 page manuscript with adequate pictures of an ecological treatise of the bird species of Utah. This attempted to portray the niche of each kind in biotic communities which they inhabited.

In addition, he kept field studies of reptiles alive by discovering winter dens of the desert tortoise which he studied in collaboration with Ross Hardy from 1936 to 1946 when they produced their paper on the desert tortoise also published in Ecological Monographs (April 1948). This was supplemented by a study of a snake den in Tooele County, Utah from 1940 to 1952. Part of the results were published in Herpetologica in 1951. Both studies were based upon data obtained by marking individuals for identification and recapturing them from time to time.

He also joined the Pacific Gull banding project and banded between four and five thousand young gulls on Egg Island in Great Salt Lake in the years 1939 to 1943. In collaboration with Wm. H. Behle and John W. Sugden, this was reported in a bulletin of the University of Utah. Later, the report of the whole Pacific Gull Banding Project was prepared with the help of Howard Knight.

During each of the summers of 1937 and 1938, he spent ten weeks with expeditions of The American Exploration Society in the Navajo Country of southeastern and northeastern Arizona studying the biota of that rugged desert, canyon and mountain terrain where he emphasized study of the ecology of birds. In collaboration with H. N. Russel, Jr., he prepared a manuscript on the Birds of the Navajo Country, which appeared as a bulletin of the University of Utah in 1945.

A continuous stream of small papers has continued to flow from his pen since he first started writing for scientific publication in 1928. By 1940, he was ready to synthesize a course in animal ecology. He took leave from the University for six months and set out on a quest for ecological experience. He spent six weeks of summer school at the University of Wisconsin and five weeks of post session at Lake Itasca at the University of Minnesota field station.

Later, he attended the symposium on aquatic biology at Madison, Wis., visited Emerson at the University of Chicago, attended the bi-centennial meetings of the University of Pennsylvania, worked in the U S Fish and Wildlife Service in Washington, D. C. about 3 weeks and attended much of the fall quarter at Duke University with Pearse and Oosting. On the way home in December, he visited Tulane University, Walter Taylor

at Texas A&M College and the University of New Mexico.

By discussion with ecologists all along the route, an outline for an ecology course was organized and then modified with further advice until by the time A. S. Pearse at Duke University saw it, he suggested the idea of publication. The outline was used as a basis for teaching classes from 1941 onward, first as animal ecology, then as it was modified by experience, it was transformed into a general ecology course in 1948.

The text was partly written from time to time but in 1948, after finishing the manuscript on birds, attention was centered on the ecology text. Carbon copies of the manuscript were used by students of the course as a reference work. It was modified from time to time as experience indicated.

During the early days at the University, funds were limited and so programs of field investigation were planned within the limits of resources available to him and his students. Later, research funds gradually increased and minor assistance became available. In 1952, he became director of a University project dealing with ecological research.

During his field trips in the Navajo country, he became intrigued with the problems of how animals, especially lizards and toads were able to live in that desert region. He found that in addition to adaptations of body form and physiological functions, they possessed behavior patterns essential for living in such a harsh environment. During the next 15 years, he studied the ways and means by which many different kinds of animals were adapted by suitable behavior patterns to find the necessities of life in various kinds of environments. He interpreted this continuing search for necessities as a method for finding ease or comfort which in turn was being continually upset by the physiological needs of the body or by changes in the environment. This exploration of the principle of comfort seeking in nature led to the writing of the book Quest for Comfort, and expansion of one aspect of general ecology.