

separated in the ancient trees
for obvious reasons. Gigantic
roots were needed to uphold
gigantic ~~stems~~ & vast branches.
Such huge structures were
incapable, by themselves of
directly taking up the nourishment
from the soil. The delicately
organised rootlets did this
work - & these very rarely branch
but the dual form of the
aggregate of the root-structure
simply represented the two
morphological features of
Dichotomy & internal organ-
isations now found in the
dwarfed rootlets of *Lycopodium*
& *Selaginella* -

With affectionate remembrances
to Mrs Gray from wife & self -
ever yours W C Williamson

Williamson W.C.

Fallowfield

Manchester Oct. 11th 1882

My Dear Friend

Many thanks for
your kindness in sending me
two boxes of specimens - all
of which reached me safely.
Here all is going on as usual
work work ever work - something
with results - often without -
or with but negative ones -
yet even these latter are often
like signposts - preventing our
wandering further along a wrong
road - Tell me what you

think of the following:
You are aware that the true
exogenous roots of *Lepidodendron*
& *Sigillaria*, (*Stigmaria*) are
true sympodia - their dichotomous
branching being most
characteristic of them. But
these dichotomizing structures
give off rootlets which are
arranged quincuncially upon
Now the structure & position
of the unipolar vascular
bundle of each of these
rootlets is identical in
structure with that of
the roots of the living Lycopods - in which roots
alone - amongst living plants

Do we find any similar
examples of true sympodial
branching -
Looking at these facts
~~now~~ in the light of Evolution
may we not fairly conclude
that the double characteris-
tic of the ancient roots -
rootlets referred to - divided
between the two organs
have gradually combined -
so that in these recent Lycopods, the degenerated de-
scendants of the ancient trees
they are combined in the
single organ - the dichotomous
root. The two features were



Williamson, William C. 1882. "Williamson, William C. Oct. 11, 1882." *Asa Gray correspondence*

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