

SAWDUST AND FISH LIFE.

BY A. P. KNIGHT, M.A., M.D., PROFESSOR OF ANIMAL
BIOLOGY, QUEEN'S UNIVERSITY, KINGSTON.

(Read 14th February, 1903.)

CONTENTS.

PART I.—HISTORICAL	426
PART II.—EXPERIMENTAL	433
SINKING OF SAWDUST	434
AQUEOUS EXTRACTS FROM SAWDUST	436
AERATION OF WATER CONTAINING EXTRACTS	437
SOURCE OF EXTRACTS	437
WOOD CELLS AND CELL CONTENTS	438
PULP INDUSTRY	439
BRET SUGAR INDUSTRY	439
SOLID MATTER IN AQUEOUS SOLUTION PINE	440
SOLIDS FROM CEDAR	440
EFFECTS OF CEDAR SAWDUST SOLUTION ON PERCH	441
“ “ “ LEECH, SNAIL, VORTICELLA	442
“ “ “ WORMS, TADPOLE	443
“ “ “ BLACK BASS FRY	444
“ PINE EXTRACTS ON FISH EGGS	444
“ “ “ MINNOWS, PERCH, WORMS, TADPOLE	445
“ “ “ CRUSTACEANS, HYDRA, VORTICELLA, BASS.	446
“ MAPLE EXTRACTS	448
“ HEMLOCK EXTRACTS	448
“ BRITISH COLUMBIA CEDAR EXTRACTS	448
“ RED PINE, OAK, ELM	449
RAPIDITY OF SOLUTION	449
FISH AT MILL ENDS	450
A STAGNANT ARTIFICIAL POOL	451
COMPARATIVE EFFECTS OF PINE, CEDAR.	452
“ “ HEMLOCK BARK, CEDAR BARK	453
“ “ HARD WOOD SAWDUST	454
“ “ CONCLUSIONS BASED ON	456
EXPERIMENTS WITH WHITE PINE BARK	457
“ “ HEMLOCK AND CEDAR BARK	457
DECAYING SAWDUST	458
BACTERIA IN WOOD EXTRACTS	458
AROMATIC COMPOUNDS	459
NUTRITIVE RELATIONS	461
SAW MILL ON THE BONNECHERE RIVER	462
CONCLUSIONS.	465
ACKNOWLEDGMENTS	465
DR. CONNELL'S BACTERIOLOGICAL EXAMINATION	466

NOTE.—The trees mentioned in the following report are: White Pine (*Pinus Strobus*, L.), Red Pine (*Pinus Resinosa*, Ait.), British Columbia Cedar (*Thuja Gigantea*, Nuttall), Ontario Cedar (*Thuja Occidentalis*, Linn.), Hemlock (*Thuja Canadensis*, Carr.), Maple (*Acer Saccharinum*, Wang.), Elm (*Ulmus Americana* Linn.), Ash (*Fraxinus Sambucifolia*, Lam.), Oak (*Quercus Rubra*, Linn), Spruce (*Picea Alba*, Linn).