



E. (p. 2)

6. Are present rotations too long?

Seems probable. Reasons.

- a. Prevailing things prescribe it. (B not used)
- b. To low i corp, cost of match regen. small, low i. Esp if antic AP. & deferred yields make it likely much timberland is w. esp. low i. corp. holders.
- c. Standard yield solutions & prevailing rotations.
- d. Tendency to overest AP

Other hand, much depends on system of taxation. Gen. prop. tax makes too short. Const. site cap. tax not affect, except encourage opt, but not common. Severance makes too long. - also inc. tax, etc, - this type growing.

F. Conclusions.

E.

(Briefly state, didactic manner)

1. Effect of regim. costs

Lengthen rot-n. Also do hurt cost, severance tax.

Look at as spreading cost over more yrs; or as lower a .

2. Effect of i (see Duerr etc sheet)

Do affect i ^{opt.} rot-n, Bld's to contrary. But not as much as Allen implies.

May affect actual rot-ns more than do opt. rot-ns. Bes nothing forces landholder of clean title to timber land to ~~adm~~ take trouble of adm'g it for max. soil rent, except pressure of ^{imputed} int. on title. The higher that o.c. of funds in land title, the more likely is ~~land~~ absentee or unenterpr's holder to sell

So lower i doesn't nec. stimulate "better forestry". Less pressure to
(see analogy, ec-zen timberland, encourages slipshod practices - slow ^{space} ~~match~~ regen,
p. 11) non-opt. rot-ns

3. How much inv. in restocking is ec?

Restock'g affects yield: more per acre, & sooner. Figure value of a at $\underline{7}$ for various combos, get best. (Petriini 65)

3½ How do taxes affect rot-ns?

Depends on how levied. Const. annual site tax, no effect. Severance lengthens.
Annual tax on timber shortens

4. How much tax can forest pay?

Up to max. a , levied annually. Poorly adm. forests cldn't, but effect of tax is to shift lands to those who ~~will~~ can impute highest 'a'. Any higher tax uncollectible in long run, lands revert for taxes.

More total tax can be collected this way than any other, but others have excess burden, change rot-n. Cite Hagenstein, Bronson, Fairchild, Finns, etc; no land's yield capax.

5. How much altern. income may be foregone for forestry?

a . (See Topics to Cover, p. 11)

Certainly discon much is underused, ~~stated~~ as is. Probly discon, even at opt. rot-ns, much shd. turn to agric.

Not attack on "cens-n". Lands better suited for agri. removed from timber, lessens pressure to clear hillsides for agri. Might result in more land area in timber.

E.

- Some important applications & impl-n's of Faustman's form. (Predict effects of changed conditions, & policies. & Evaluate forestry as practised)
1. Judge among diff. kinds of restocking; level of C. Select to max. a. Will reforest or pay? But affects little? Yield tax has same effect
 2. $\Delta C \rightarrow \Delta \text{rot-n.}$ Δ hst costs, same effect as Δ plant's cost. But affects little? Yield tax has same effect
 3. Δi ~~little~~ affects opt. rot-n. (but may affect actual rot-n's) ^{less than we thought}
 4. Foreclosure will. Bld's sort of right. Quern notes, 4-11, 14. Bld's notes p. 1
 5. $a \approx P_i - \Delta P$. $\frac{a_1}{a_2} \approx \frac{i_1}{i_2}$ when yields not annual? - Work out.
 6. Low i doesn't nec. $\rightarrow$ "better forestry". Less pressure to ex-ge on land, $\rightarrow$ slipshod use... in many ways, includg long rot-n's.
 7. What i to use? To each his own. Main levy is then land mkt - reform by taxes or equalizg i .
 8. How much ~~can~~ taxes can forests pay? Max. a - if levy tax w/o excess burden, on site. ^{Can pay this much w/o disturbing rot-n's, actually improve.}
 9. Δ tax focus all to this opt. rot-n. - or into other use, if it yields greater annual = nt. ^{Cite Hagenstein, Brønner, Fanchild (?), Firms, pro land's yield capacity}
 10. 7. formula thus also tells how much alternative annual inc. can be foregone to grow trees - maybe one reason ~~for~~ not universally accepted, so clear makes matters that many hv. find a prof. int in keep's fuzzy. ^{See if forestry meets o.c.}
 11. See topics to cover, 11.
 12. Present rot-n's tend to be too long
 13. a. Bes practitioners use thys dig so. (Bld's shorter, but not used)
 14. b. Faustman n_x is $<$ known n . More tenuous, needs more research.

Are legit reasons: natural reseeding; antic. ΔP ; higher C , incl. hst, than 7 figured;

But also illeg: Treat site as free good. Not forced to ex-ge... learn on Bld's to put this over.

Mopy - nat. forest policy? (Greely, Margolis)

Probable overest. ΔP , from past experience.

Fashionable to sneer at small. Maybe their short rot-n's, & clearing for ag, make sense.

F. Conclusion

Hope advanced understanding; & immed practical appl-n. Pvt. appl-n, more fruitful than further tech. knowledge, so many monstrous rot-n's in use.

Fort, is a trained forestry prof. in close contact w. practice, via whom ~~some~~ ideas can go to work. Guide social policy, esp. Nat. forests; reg. & tax's pvt.

Rival concepts of financial maturity.

Bldg has reopened, rev. new...

1.

A. Prelim

1. Intro - summary. Include big names here as eye-catchers. Fisher etc., No int. group. & Faustman, which advances correct. Simplest elements 1st, then embellish. (Not Knight-Hayek - finite maybe)
2. Formulate problem. Lay down wine, when take it out? Well, add rent etc. then. But,
3. Why solution not obvious. Rent, & simult. discovery. (Gently emphasize
4. Importance use of $MC=MP$ ($i = \frac{g}{g}$ is same, regardless of c . But should ec. on c)

a. Practical

~~b. In front of thy~~

4. What is accepted current doctrine

5. 7s ~~deplorably~~ ~~unpleasant~~ ~~the~~ 7s more than a vignette of thy. Some say all same. Impulse: a, practical. b, in climatic of livestock, fuel, timber, etc.

5¹/₂. Procedure: a. cf. ~~solutions~~, ^{Propound} ~~select~~ correct ~~one~~ solution, f. others ^{more strategic} excess drain, etc.

b. ~~Show some of its prior imptn.~~
~~Show how to modify it for use~~ Modify for practical use

c. Explore some of major implications. Discuss, show effect of various variables, e.g. higher costs.

B. The ~~soil rent~~
Faustman
formula &
its ~~analog~~
contestants.

6. Correct solution: max. annual = πt . (~~hooking fund?~~ ~~Pase to~~)
(Did Faustman etc. ever solve for n ? ~~Cf. ABR B7~~)

7. Same as Faustman, max. inf. series. This is better. Just one cycle. ~~Looks good.~~

8. $MC = MP$ of time dimension of cap. & bond.
Give full credit. Transcendental = n , and be a solution, via tables. See C, I.

8. $\frac{1}{2}$. Put in Sutherland form - solve for p , easiest form for working. Same const.

C.

 $8\frac{3}{4}(\text{over})$

9. 1st rival: ~~Bldg, max internal~~ Simple disitg ($\propto \frac{g-c(1ki)}{(1ki)^n}$)

a. Fisher, Wicknell, allen (8)

Fisher, Wickell, Allen (8) guess same opt (butcher, n)
~~260~~ is another reduction
Reduction, $i=0$, shd reduce to ~~over~~ $\frac{2}{n}$ max, not g .
another reduction - pleases product unexhausted.
Soil rent does so. (so do some false formulae) Notes on land?

Or, diff'g, get $p = \frac{g'}{g}$. Ignores other costs. (Wicksell guards it?)
 MC $\neq$ MP. Appropriate analogy. Gives too long a rotation.

b. Guttenberg, variation, more subtle. "Find maturity"

Contempt for thy: all same ideology - even Bldg!

Practical men, drop theorists C.F., like curvature of earth.

"Proof": fallacy of good cond. from one arith. e.g.

The practical man, has not taken field data, but synthetic e.g.

Dong Fir data, bigger effect.

Synthetic data, immense. LAP makes them plausible
Further case of 5-in unit - which may magnify small obscur
small diff.

By dropp'g both
(8 @, error offset.

check num. e.g.

96 is one thing forests have abundance of, is time ^{no snap judgments} ~~to decide~~. Ideolog. bed/ellows: issue land philos. Synthetic data, immense. & 47 million ^{Further on are 5-yr unit - which may magnify as well as obscure small diff.} Bronson variation. Value site at low-yield; alternative, graz, in effect eliminate from reckons.

8 $\frac{3}{4}$. Graph, showing major rival concepts. Thus give reader overview. Give brief summary of rival concepts before start.

76 ~~anyone in ~~our~~ ~~time~~ ~~to~~ ~~make~~ ~~over~~ ~~the~~ ~~decision~~~~ ^{+ his rushing modern world} ~~when to cut ~~a~~ ~~tree~~ his trees.~~ ^{has time to mull over ^a decision, it is the forester pondering}

~~If there is~~ It wd be hard to find ~~an~~ ^{other} way in which decision makers have so much time to ~~ponder~~ ^{ponder} meditate as they do in forestry.

Pioneer's effort, improve on Fisher etc.
 Revolutionary new criteria. Disavows
 $MP = MC$

10. 2d rival: Bld'g. ^{Rendered service by reopening gn.} (Instead of 6 writers & one solution, here is one w. 2 solutions, ea. of which he alleges are = to a 3d, max. soil rent)

Max. internal i. ^{As no effort n.} Like Lutt., fallacy of deriving law from arith e.g. - l of
 1st. is not same as max soil rent. Nor same as B's version of max. soil rent. This is
 Reductio, $c=0, i=\infty$ for all n, no solution. $MC=0$, never cut (bes no rent) his proof
 another reductio: impute all to cap, none to land. Soil rent ok in this case.
 Are 2 other things to consider, to ec. on nothing.

Annual use of land

Cap. secreted by land (other annual costs assumed 0)

of course, Bld's disavows. But does he think superior criterion is (only)

$MC \neq MP$. Analogy. Max. AP of one factor. ^{Impute all yield to cap, none (own)} In this case, of just

part of one factor. Ok on free land - so is simple disc, & they
 give same result. Show i curve as AC, rise to exhaust product at max AP.

Too short a rot-n, (as a rule? No, always, for $\delta > a$ always, & when
 $c=0, a$ indet.)

11. 3d rival.

Group of solutions w/o i, or $i=0$. Still taken seriously by
 some foresters & used in practice. Also ~~if~~ ^{wd.} be taken seriously
 by ~~some~~ those ex-sts who still advocate or entertain. O int., euthenasia of
 rentier.

a. Max tree growth. $g'=0$. Advocates ^{include} ~~limited~~ to mystics? But
 ignores both int. & $\frac{1}{n}$. But note how close to this is max $\frac{2}{(1+i)^n}$, as

$i \rightarrow 0$. & nat. forests held this way. $MP < MC$.
 analogy: ignore all costs, ^{selected} exclusive att'n to ^{values} ~~land & int.~~

b. Max. ave. annual growth. Omits both costs & int. - (perhaps cutting
 as well as other costs.) 2 omissions tend to offset, may approximate correct δ .
 French public forests.

c. Max. ave. annual net growth. ^{Same as b?} From German, known to foresters
 as "forest rent" max. (not confuse w. soil rent). Includes

lengthening factors, omits shortening ones. Long rotations

Since 1849. Advocates hide their reasons - collect quotes.
 Analogies, links. Hard to explain persistence, but still pop. w. foresters, &
 seriously propounded in lit. Seems One expl-n is mercantilism,
 but this gives $< \max \frac{2}{n}$. ⁴ other possibls wd. suggest: a, Rationalize
 lax adm. of large estates. b, Rationalize mopy practices. c, Rationalize

B. asserts B. is correct in thy; B. uses discontinuous e.g.; & B. is farther from rt., misses obvious reductio.

to land, bids sell all land, invest in cap.

max. soil rent. His proof is no proof. $MP - MC$ is max soil rent. He says rep. of cycles changes. But derive max. soil rent from rep. of cycles. He doesn't derive his - ~~just~~ his only argument for it is asserts it is max. soil rent, which we prove ~~wrong~~ it isn't.

possibly legit. reasons for slower cutting, e.g. watershed protection,

recreational values, which advocates were unable to formulate or submit to judgement undisguisedly communicate directly, explicitly. d. Prof. aggrandizement - soil rent gives annual =nt, easy to cf. vs alternatives. e. O-int. philosophy - coupled w. subsidy to forestry.

opt. 12. 4th rival. Sustained yield.

philos. f. Merge land w. cap. philos.

Weakness for simple slogans, due to difficulty of communicating national principles. Rigid, bound to lead astray.

13. Summary. Analogies w. conventional ballistics rough, in detail. Pl in common, weakness for (over) Maybe end 1st article here, try to get 2 from it. Why not? 2 articles better than 1.

~~c. The Faustian formula. in practice~~
~~Use of~~ ~~Modifying the 7. formula for practical use, applic-n~~

1. Gattenberg form.

(Can't solve for n , in genl. Even if got $=n$ of growth curve. Must approach by trial & error. So don't make $=n$, - besides, $=n$ is rigid, reps only one factor, doesn't allow for yr to yr ΔP , which toward maturity is larger factor.)

Tables for ϕ

2. Adapt to change data. Adumbrate only. (Quen notes p. 17; Thinn's p. 18)

Do this from start a. Derive look's fwd. ^{Hist. costs only relevance is as means of comput's rent. But even that better} Maybe one not $=n$, use other site ^{rent} value, drop ϕ

b. Include ^{other} annual costs & incomes - thinnings (const. ones don't affect, sporadic ones do) Add $\sum \frac{T_a}{(1+i)^a}$ to base - orig. w. one?

Fixed annual costs no effect (do they affect rent, thus ϕ ? Do const. annual inc. Δg ?)

c. Judge among diff. kinds of restocking - hitherto this held as a

const. (Mainly a job of great numerical detail. Describe briefly) (Don't bother convert's delay to C_0 ; but change yield tables. Select combo of C_0 & yield giv's max. a)

d. Consider ΔP . Is major factor ~~at~~ toward ~~fruct~~ maturity. Hence great practical value of Gattenberg form.

e. What is to use. To each his own, in practice. Ideal calls for better cap. mkt's. But may not make much diff., save than land mkt. & that otherwise soluble.

Some important
D. Implications of the 7. formula.

~~Bld's rendered service by copying you~~

grasp's at one incomplete criterion, max. it. — & vindicate results by
crude arith. e.g.! Bld's, Gutt., Kearns

Anti-intellectual, all-same ideology. ^{Hairsplitting, strain at gnat, scribes & pharisees} Apex in Gutt's identity of J.
While not deny's our prof. deserves its full share of scold's on this fault, here is not case in pt.
Summarize scale of, range of solutions.

Supply to outline

Handle planting costs easily
thus:

If spend M , call it C .

If just let time do it, let $C=0$
and yields come later. Is no
need to relate deferment of growth
into an initial cost. (tho can if
wish)

cf Petriani

Opening

SUMMARY:

This study investigates the problem of finding financial maturity, *with especial but not exclusive attention to timber, harvest.*
The problem may be likened to one of ~~what~~ when to adjourn a convention.

There are two ~~general~~ elements of urgency ~~to~~ prompting us to close the meetings: to release the men; and to release the convention hotel space.

The problem is to balance these two costs against the benefits of prolonging the meetings, and arrive at the optimum hour of adjournment.

The ~~problem~~ solution is elusive because in practise the "hotel space" - the site, ^{often} has no predetermined cost but must be imputed one in the course of solving the problem. This calls for a simultaneous solution, which is provided by Faustmann's formula. *The paper presents this formula as a marginalist solution.*

The paper then criticizes other current concepts of financial maturity for failing to deal with both elements of urgency. *The chart on p. 11 lays out the various (concepts)* Allen's and Fisher's

TP "maximum discounted ^{yield} ~~harvest value~~" allows nothing for the second element, release of the site, and drags the ^{convention} ~~solution~~ on too ^{long} far. The foresters

Duerr, Guttenberg, and Fedkiw raise the question whether this omission

makes any practical difference. The paper ^{specifies the conditions determining} ~~deals with this question at~~ *how great a difference it makes, and concludes the difference is often of practical length, concluding that it often does make a practical difference and is consequence and likely to become*

likely to moreso in the future. The paper presents an ~~very~~ ^{simple} easily operable technique for finding Faustmann's solution in practise.

Boulding's maximum "internal rate of return" likewise overlooks the second element of urgency, but in the process puts much too high a value on the first and ~~arrives at the point where~~ adjourns the meeting prematurely. The paper discusses the choice among Faustmann's, Allen's and Fisher's, and Boulding's solutions. It finds the advantage of Faustmann's in its dealing adequately with both elements of urgency, and discusses how the rejected solutions, especially Boulding's, may be partially salvaged within the framework of Faustmann's formulation.

solutions considered, in their relationship to the two elements of urgency.
Only Faustmann's and Hildreth's integrate both in the solution.

Next the paper criticizes zero-interest doctrines for ignoring the first element of urgency, and ^{looks for some reasons} asks why such indefensible doctrines ^{are tolerated by} stand so high ~~with~~ many foresters.

The paper ~~criticizes~~ then elaborates Faustmann's formula to deal with intermediate costs and revenues, and suggests how ^{the formula} it might be generalized ^{in general, to deal with depreciating assets and} ~~to~~ beyond forestry, beyond appreciating assets, ~~like timber,~~ to contribute to the accurate solution of all economic problems of replacement or turnover.

Finally the paper applies its analysis to a number of practical questions. It concludes that forest rotations in the United States are on the whole uneconomically long, through inadequate recognition of one or the other element of urgency. It implicitly suggests improvement through wider adoption of Faustmann's formula, and changes in forest taxation, ^{leading to} remove obstacles to its application.

Professor George Morton has pointed out to me another operable solution, one which practising foresters may prefer in some circumstances. He points out that the year of financial maturity is unaffected by whether or not we compound regeneration cost. This is not immediately obvious, but seems to hold up mathematically.

This lets us drop the compounding term, $(1 + i)^t$, following C_0 in Equation (3), which defines the site rent -- Morton would prefer another term instead of "rent" -- which we wish to maximize. (We can also drop ρ , which is not a function of time and does not therefore affect the solution.)

This leaves us with a simpler expression to maximize:
$$M = \frac{g - C_0}{(1+i)^t - 1}$$

Tabulating the denominator as a reciprocal we can arrive at the maximum value of M , in any particular case, quite expeditiously, simply by trial-and-error approximation.

~~This formulation has the disadvantage of not lending itself to very easy or accurate interpolation, especially near the maximum point, which is the point that is critical of course. If growth data are given in five or ten year intervals, as they usually are, this is a handicap.~~

This formulation would have the disadvantage of being limited in its application to instances wherein all revenues and costs were concentrated at the end-points of rotations. Where there are intermediate costs and revenues, compounding factors would have to be reintroduced, which would destroy the simplicity, hence the advantage of this technique. Neither is the solution readily adapted to handle changes of data that occur in mid-rotation. It presents a certain danger, too, in that the expression being maximized has no significance in itself, but only coincidentally reaches its maximum simultaneously with the a of Equation (3). The danger is that values of M might erroneously slip into use as values of a , either by sheer carelessness or because an operator using the formula might think it had some normative value.

Changes

1. ~~re Neg. so it rents.~~
2. ~~Value of Bldgs - tells us max i , if ~~the~~ land has no alternative, let $a=0$.~~
3. ~~Date~~
4. ~~Appendix for Fig. 1 figures.~~
5. Faustmann opt. not very critical? Not w. En Lench. - a is quite flat. But this is true of all averages. Mgmt is thing to watch.
At higher i , & w. tapering, more critical
- 5.5 ~~Drop argument re W approaching max. at small a .~~
5. Maxima not very critical. a few yrs one way or another doesn't hurt much; for other conveniences.
6. ~~"Naval stores", vital mkt ind-y. - obsolete~~

Summary

1. Duerr in effect rejects soil rent, while according it formal recognition. By slighting it in text; & choosing ~~that~~ example where it appears not to affect result. He belittles not just results of offsetting influences; but C.F., or $\frac{(1+i)^n - 1}{(1+i)^n}$ itself.
2. Constant annual expenses don't affect opt. r. They don't affect derivative of soil rent, or Bodenerwartungsrente.
3. Use of soil rent, as vs. $i = \frac{g'}{g}$, reduces influence of i on opt. rotation. Bes in $p = \frac{g'}{g-c} \left(1 - \frac{1}{(1+i)^n}\right)$, the "correction factor" offsets the p to a degree, as i changes.
 ✓ ? — (But use of an external soil rent, P_{si} , might be another avenue of influence)
4. In soil rent formula, higher i means shorter rotations
 ✓ The effect of Δi on rotations is greater, the greater are i , and g ; and the lesser are g' and c . And these differences are very great.
 ?
5. Soil rent introduces 2 concepts lacking from $i = \frac{g'}{g}$.
 One is economy of site, which acts thru averaging yields out per year & calls for shorter rotations. The other is economy of planting costs, which need to be spread over yrs, & call for longer rotations.
6. Very simple practical procedure indicated: Forester has table of correction factors, and when $p = \frac{g'}{g-c} \times \text{C.F.}$ he cuts.

Contribution of my article: tell if forestry is paying its way.
- maybe at opt. yr it will, while hack job like Redman's
gives unduly low returns, discourages forestry.

~~It ^{was} not so long ^{ago} after all, ^{that} ~~some some or its were speak's~~
~~confidence of the "enthusiasm of the renter".~~~~

My contributions

X 1. Add $\sum \frac{T}{(1+i)^a}$ to base on which reckon % growth.

~~2. Bld's error~~

~~3. Guttinby error~~

X 4. Effect of various internal i on rotation, thru imputed cost of land.

X 5. What i to use

~~6. Prof. aggrandizement vs. best use of land - rejection of optimizing for non-communicable reasons. Collect some quotes.~~

~~7. Analogies of errors. Bld's is max. one factor AP~~

~~Gutt. is fail'g to divide by n , gets $g' = 0$ when $i = 0$.~~

X ~~8. Practical thought: antic. AP is major det., when $\rightarrow$ opt. n . But keep Φ , to express urgency of us'g land~~

~~9. Δi little affects rot- n , thru Faustman.~~

X ~~10. Annual rent approach is same as inf. series, but involves less unreal assumptions, is easier to adjust.~~

(Bldg:) Δi

Bldg's pioneer effort, welcome, in field which outstanding masters of a thing he left to less skilled & disinterested hands, & in which primitive fallacies & emotional prejudices run rampant.
Bldg's reached bizarre conclusion, departs from mgntism

Will show ~~errors~~ ^{principle of $MC = MP$ holds true here as elsewhere; & i affects opt. pd.} ~~right answer~~. Here's how: - - - - -

- o. Bldg's said ----, briefly summarizing. Use mgnts, for sharper focus.
- a. He justifies max i by saying = max rent. But doesn't. Bldg's erred by using arithmetic e.g.; by ignoring rent on care; by not incl. rent w. MC - etc.; by misdefining max i as formula for max. rent.
- b. Max rent is correct, but is net concept. Identify this w. $MC = MP$, appeal to most by identifying self w. that. Simul. sol. Show wastage of max i : Look to future. Over
Lessons, implications o. Hold's to maturity is not good conservation. Bldg's right, here. max as one input
c. 1. Max i is analogous to crude error made often Opt. is max. A.P.P.
2. $MC = MP$ is ok, not to be abandoned here. (Gives pd. a little diff. from max. i - despite rep. of cycle - meet Bldg's on this one.)
3. a) i affects pd. ^{longer, shorter?} very much, by 2 levers. Is urgency to release site, as well as release funds in trees. The first may be as impnt as 2d, or more, but is nigh universally ignored. Underest. by Tak's other alt. use, grass e.g., or int. on title. Is hi in practice, where nat. restock, e.g., is all.
b) Diff. intensities of land use, consequent on diff. i , manifest selves, one way, in diff. pds of cuttg. Lo i wd. not slow cuttg just to achieve lo i ; but lo i permits to expand lands w/o expandg cuttg, mngg, etc. org. aly, cut & restock slower. Expect-n of Δ s to site may further reduce net cost. Use of natural restocking too.
Big co.s cut slow bcs site cost to them is less than opp. cost.
c) Lo i does not nec. lead to "better forestry"; if that is effect thru orig. costs, Co. is good; but thru site, not. Leads to slower cuttg often (tho not defined ec-ly. Leads directly to ~~that~~ lett'g lo i possessor hold land to which imputes less rent. (This might sometimes lead him to cut quick, to reduce trouble of guardg?)
(Certainly leads to wasteful practices: sloppy logg, undue xptn cost, subord. Slower cuttg isn't nec. more ec., or conservationist burst to mill etc.)
forestry. Prof. forester's reaction vs sawdust savages shdn't blind us to other kinds of waste
Lo i on site leads to slow cuttg just as may lead to sloppy logg, undue xptn, etc.. Thus does not rep. conserv'g of

Cap. mkts lead to vast discrep of MP of land & timber on diff. hld'gs.
Lo i may just be sloppy; or cut slower.
Probbly expand, either case.

d) Taxes, diff. effects of 2 kinds
d) Which cost higher in practice? Where depend on natural restocking, public guardg, is all rent.

Max. i method of no use at all when is no orig. cost, C_0 , as in natural restocking. Then all is rent. W/o figuring rent, wd never cut, as is no M.C.

Max. i leaves diff. of i on trees & on site, if regard i as genuine. Gives $h_i i$ on trees, none on site, bids i sell land, put M in trees, ad inf.

c. 2. Is just to say best alt. use of one input, land, is in next cycle.

Little value

Unsolved problems: Solve as they come up, if they do

1. Use future, not hist. costs, from start. Saves later shift-over, & confusion all along.

But don't do this for all false solutions, too much work.

2. Analogy: show i curve as AC line rises to exhaust product at max.

3. Costs lengthen rotations: how does fixed item affect MC ?

Thru rent? Yes, lowers it.

- ✓ 4. Do const. annual costs & rev.s affect rot-n? Thru rent? Thru Δg ?
2 just offset? $a = p \frac{g - c(1+i)^t}{(1+i)^t - 1} - c_a$

- ~~5. Can h expand extra in forestry b/c of p de inc? Yes.~~

- ~~6. Does $\frac{g}{n}$ crest b/c $\frac{g-c}{n}$? Yes~~

Pregnant thoughts:

21.

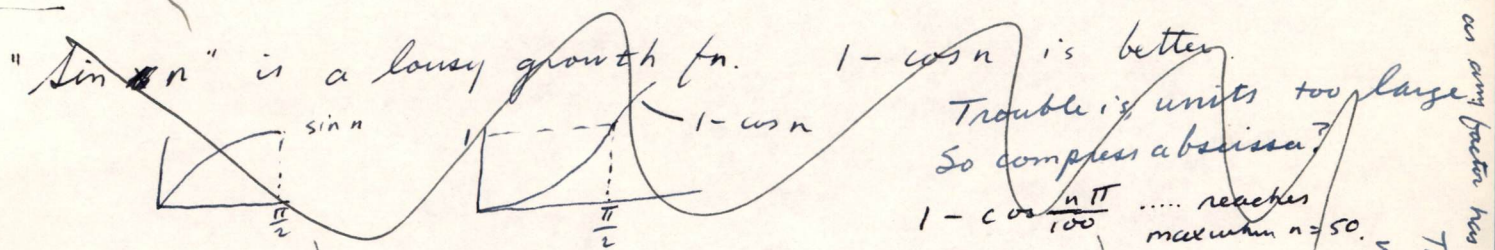
"vectors"

Capital has 2 dimensions, C_0 and n . (so do all inputs) but all
Each has its MP & its MC. The n dimension is what earns become cap. upon
int. C_0 is just replaced. Bldg is max's return to the n dim- n . being invested.

Reductio ad absurdum of "BS" (Bould's Solution) is let ~~let~~
 C_0 become very small, & $i \rightarrow \infty$. [Which also shows BS is not
an average? No - cd. also have a P labor $\rightarrow \infty$, if get product w/o labor]

Concept of "annual rate of growth" requires a base.

Also, year & wd. come very quickly - but when figure rent, it doesn't.



How can a derivative $>$ its fn? Reconcile w. elementary
MP analysis (the derivative is $\cos n = \frac{d \sin n}{dn}$)
Probably because $n < 1$.

This tends to be concealed
when land is factor.
over

How justify cutting at B, when $MP > MC$?

Reductio of Wicksell etc.

If are no initial costs, & land is free, it doesn't matter when you cut.

Time-restraints are means of economizing on land or capital, & if neither
needs it, why bother? - an interesting answer to those who say we
should conserve forests, but land scarcity not a factor, & regrowth is spontaneous.
B is appropriate when land is the only cost.

Where $\frac{g'}{g} = i$ has some mng?

Bld'g is max. return to one instant, one dose of inputs
- rather than nec. to one factor.

11, (cont). See Schlich, p. 163, of forestry vs agric. He just does it, is all

Collect weak arguments, non-communicable reasons, for rejecting soil rent.

12. Tendency, due to difficulty of communicating correct concepts & methods, for some simple slogan to take over. E.g. sustained yield. Rigid, inflexible, bound to lead astray in many cases. Other e.g.:
 $\max. i; \max. \frac{g}{n}; p = \frac{g'}{g}$

13. Taxation? | How much can forests pay. Annual vs yield (former does not affect rot-n, save as spurs owner to earn full rent; latter probly does)

?/ you figure no int., max. $\frac{g}{n}$, then
shd probly also figure site is free,
fig. max. g .