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fg 表と *fh* 表の作成に関する研究

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Miyoko Hiwatashi: A Study on the Method of Preparation of Form Basal Area and Form Height Tables

要 旨：この研究においてはプロットレスサンプリングにおいて材積計算に必要な *fg* 表，*fh* 表の作成法を研究した。プロットレスサンプリングとして最も普遍的なビッターリッヒ法があるが，これには *fh* 表が必要であり，調査実行上きわめて容易なストランド法を改良した L1 法には *fg* 表が必要である。上の2法は大面積の簡易林分材積推定法として今後大いに活用が期待されるが，*fh* 表，*fg* 表がなく，従来その適用が制約されてきた。もちろん，その作成法の研究もほとんど皆無だったので，その作成法を開発し，この方法により広く *fg*, *fh* 表が作成されることを期待している（*fh* についての山本和蔵氏の研究があるにすぎない）。

作成の具体的方法は本文の2に述べてあるが *fg*, *fh* ともに $Z=aX^bY^c$ 式を検討の結果，妥当と認め，さらにこの式につき種々統計的検討を行なった結果，$fg=aD^b$，$fh=aH^bD^c$，$fh=aH^b$ の式が適切と認められたので，それに基づき表を作成した。なお，この場合表値の決定は対数変換を行なって計算し，百分率誤差の推定について若干ふれ，最後にこの計算に必要な電子計算プログラムを開発したので，種々参考となると思われたので添付した。

1. ま え が き

プロットレスサンプリングは，調査方法が簡単かつ迅速であることから，森林調査への応用もかなり多い。1947年ビッターリッヒ法が発案されて以来今日まで，日本でも数多い調査，研究がなされている。もともとこの方法は，林分の単位面積あたり断面積を推定する方法であるが，最近はカウント木の樹高，直径を測定して，材積，本数も推定するようになってきた。ビッターリッヒ法で ha あたり材積を推定する場合，断面積定数に形状高（*fh*）をかければよいことが証明されている[1]。すなわち，標本点でカウントされた木の形状高を求め，全標本点について加えあげ，平均して断面積定数を乗ずればよい。またラインサンプリング（L 1 法）では，形状断面（*fg*）にある一定係数（線分の長さ，検視角によって計算されている）を乗ずれば，ha あたり材積を推定することができる[1]。

したがって，*fg* 表，*fh* 表を作成しておけば，カウント木の直径，樹高に応じて表から直ちに，*fg*, *fh* が求められ，材積推定も容易になると考えられる。そこで，東京，前橋営林局管内別にスギ，ヒノキ，アカマツ，広葉樹の8種類について *fg*, *fh* を求め，表を作成した。

この表の調製にあたってご指導をいただいた当時の経営部第二科長大友栄松氏にお礼を申し上げる。

2. 作 成 の 方 法

表の作成に用いた資料は，立木幹材積表調製で使用した資料である。この資料を直径，樹高階別に級分けして，全階級にわたるように本数を抽出した。抽出した本数を局別，樹種別に示すと次表のとおりである。

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	スギ			ヒノキ			アカマツ			広葉樹		
	本数	直径範囲	樹高範囲	本数	直径範囲	樹高範囲	本数	直径範囲	樹高範囲	本数	直径範囲	樹高範囲
		cm	m		cm	m		cm	m		cm	m
東京	478	5.9～100.3	4.8～39.3	377	4.9～56.7	5.1～27.1	499	5.1～85.6	5.6～31.5	484	5.6～109.0	7.1～36.9
前橋	505	3.5～57.0	3.4～31.8	400	2.3～66.7	3.3～28.8	494	4.6～83.6	5.5～28.6	495	4.2～96.2	4.9～35.1

表の作成方法は，8種類とも同じである。まず，胸高直径 (D)，樹高 (H)，材積 (V) から，単木ごとに $fg=V/H$, $fh=V/G$ を計算した。この計算は，NEAC 1240 を用いた。

表の作成にあたって，まず問題となるのは，fg, fh が D と H のどちらの因子に大きく起因しているかということである。fh は，以前から H に関係していることが知られている。また fg は，大友の論文[1]の中で，直径に関係していることが示されている。したがって fg では，Y 軸に fg，X 軸に D をとって対数方眼紙上に描いたところ，Fig. 1-i～Fig. 1-viii に示されているように，直線関係が存在していることが明らかである。一方，fh については，Fig. 2-i～Fig. 2-viii のように Y 軸に fh，X 軸に H をとって対数方眼紙上に描いた。これは，D：fg に比べるとばらつきが大きいが，直線関係が認められる。そこで，fg では，$fg=aD^b$ をあてはめ，さらによい精度を期待して $fg=aD^bH^c$ もあてはめた。fh も同様に，$fh=aH^b$ と $fh=aH^bD^c$ を用い，両式の精度を検討することにした。これらの計算は，対数変換を行ない，最小二乗法によって，回帰係数，定数を決定した。すなわち，$fg=aD^b$ は

$$\log fg=\log a+b\log D$$

となり，$\log fg=(fg)'$，$\log a=a$，$\log D=D'$ とおくと

$$(fg)'=a+bD'$$

に書き直される。また $fg=aD^bH^c$ は

$$\log fg=\log a+b\log D+c\log H$$

となり，$\log fg=(fg)'$，$\log a=a$，$\log D=D'$，$\log H=H'$ とおくと

$$(fg)'=a+bD'+cH' \quad \text{となる。}$$

fh も同様にして，$\log fh=(fh)'$，$\log a=a$，$\log H=H''$，$\log D=D''$ とおきかえ

$$(fh)'=a+bH''$$

$$(fh)'=a+bH''+cD''$$

を用いて，回帰をあてはめた。

計算結果をまとめると Table 1 のとおりである。表の最後の列は，独立変数を1つ追加することによる意味があるかどうかを検定したものである。これは残差の平方和をそれぞれの自由度で除した値の二乗比 (F) である。** 印は危険率1％で有意で，無印は有意差のないことを表わしている。

fg は，全部について有意ではない。相関係数をみても，H を2番目の独立変数として加えても加えなくてもその値はほとんど変わらず，誤差分数も，H を加えることによる効果はそれほど認められない。そこで，実際に樹高を測定する労力，精度を考えあわせると，H を除去した $fg=aD^b$ を用いて表を作成してもよいと考えられる。

fh は，全樹種について有意である。したがって，$fh=aH^bD^c$ を採用した。しかし H だけを独立変数とした場合でも，相当よい精度が期待されるので，$fh=aH^b$ についても作表した。

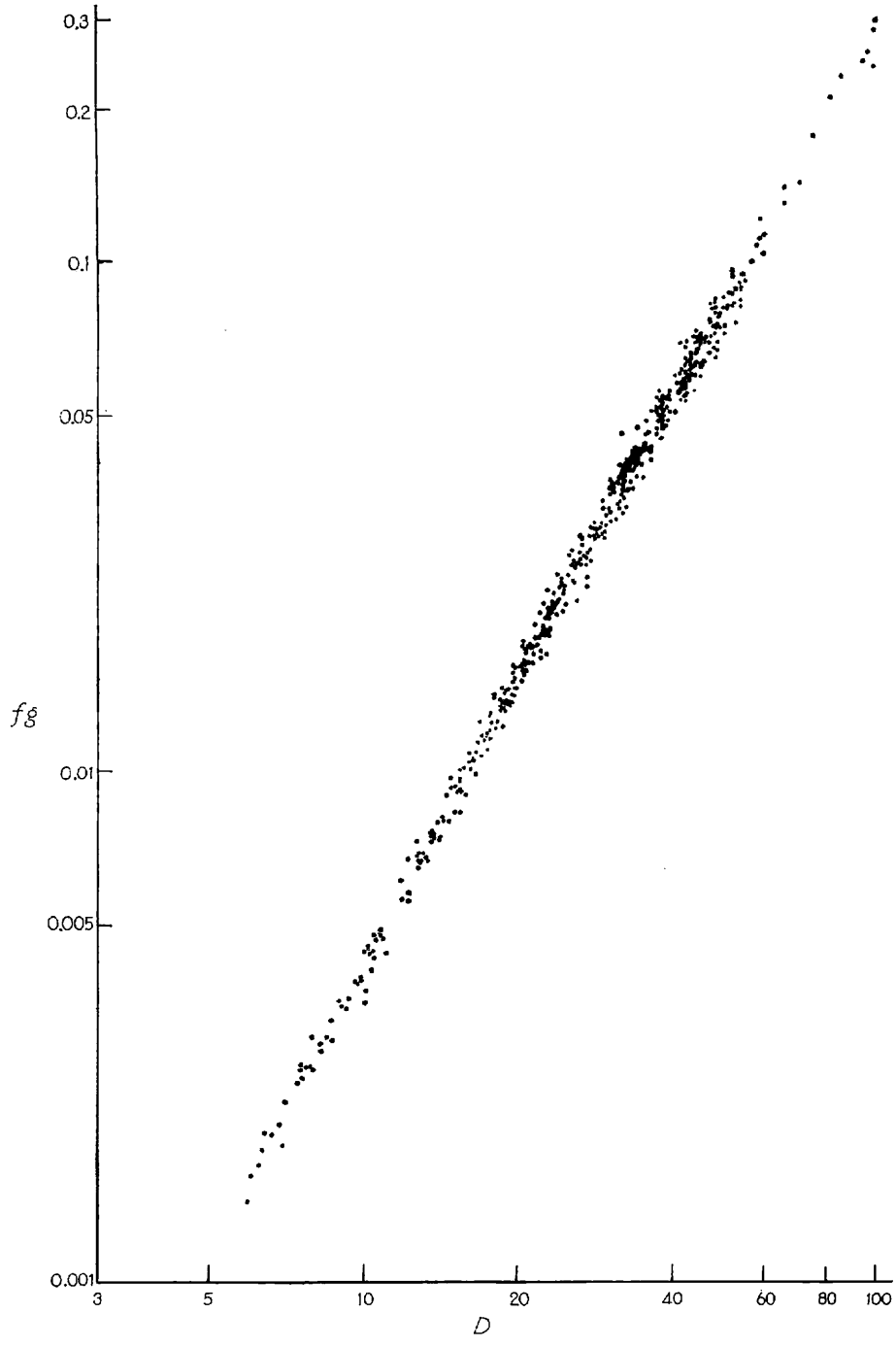

Fig. 1-i　東京スギ　D : fg

Tokyo Sugi　D : fg

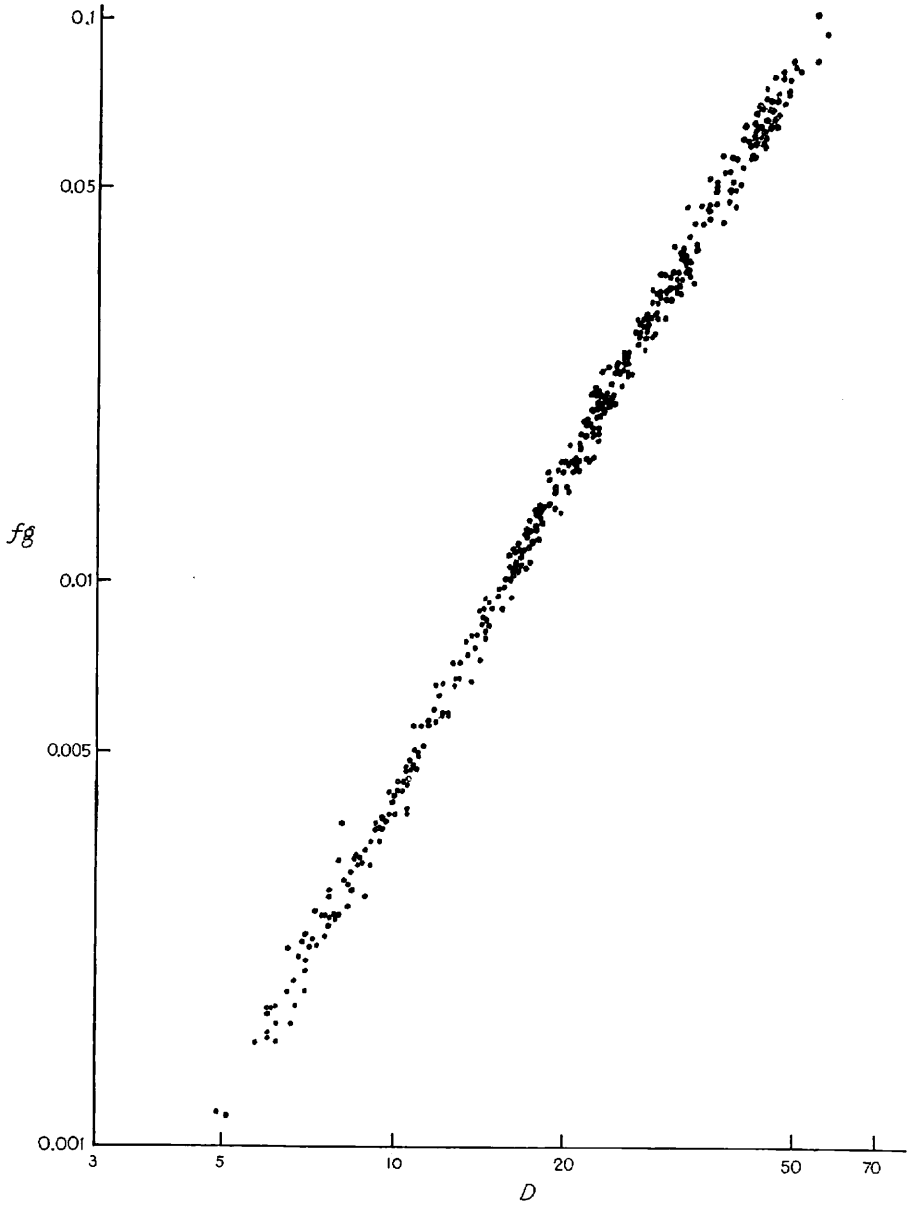

Fig. 1-iii　東京ヒノキ　D : fg

Tokyo Hinoki　D : fg

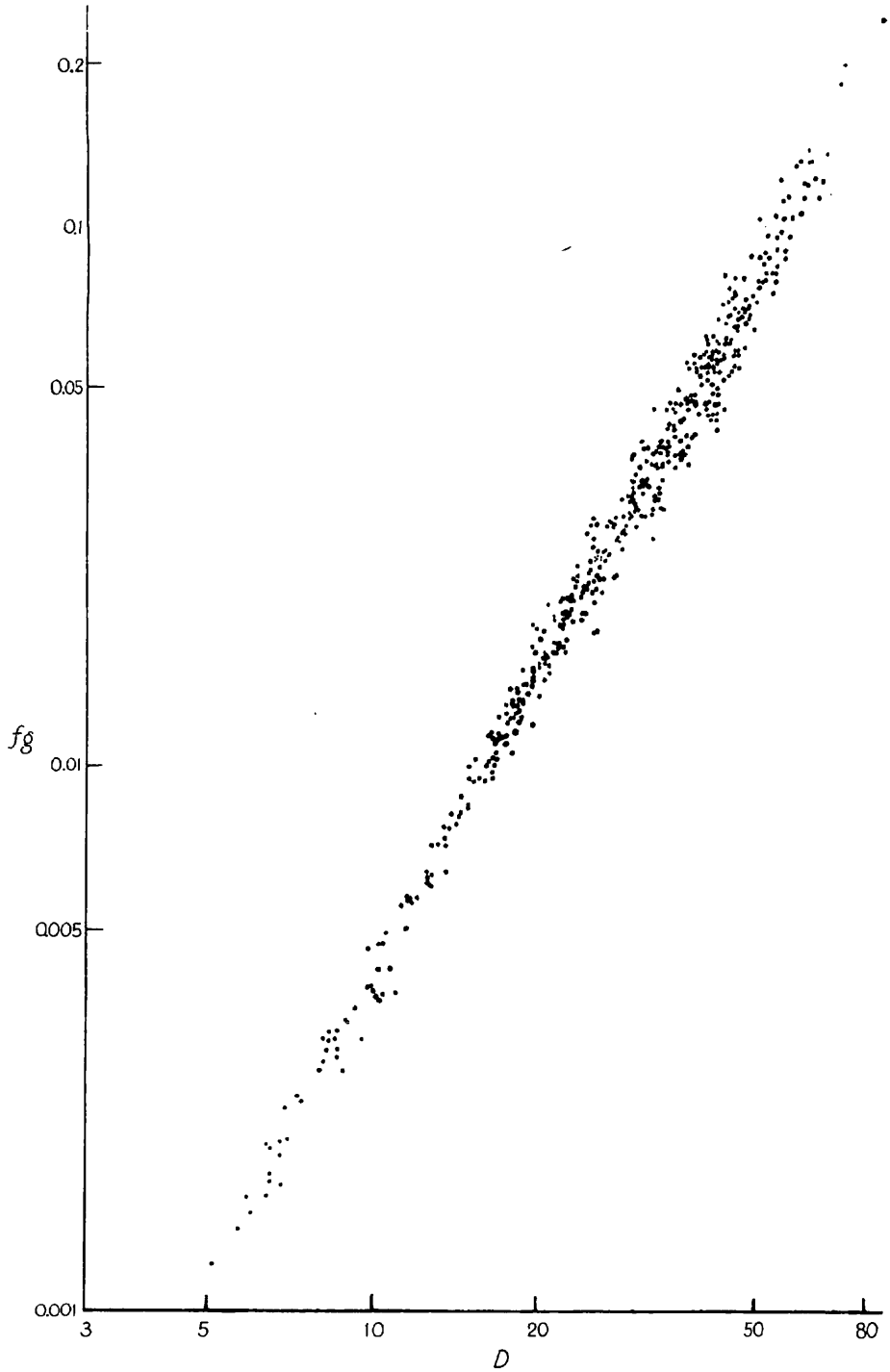

Fig. 1-iii　東京アカマツ　D : fg

Tokyo Akamatsu　D : fg

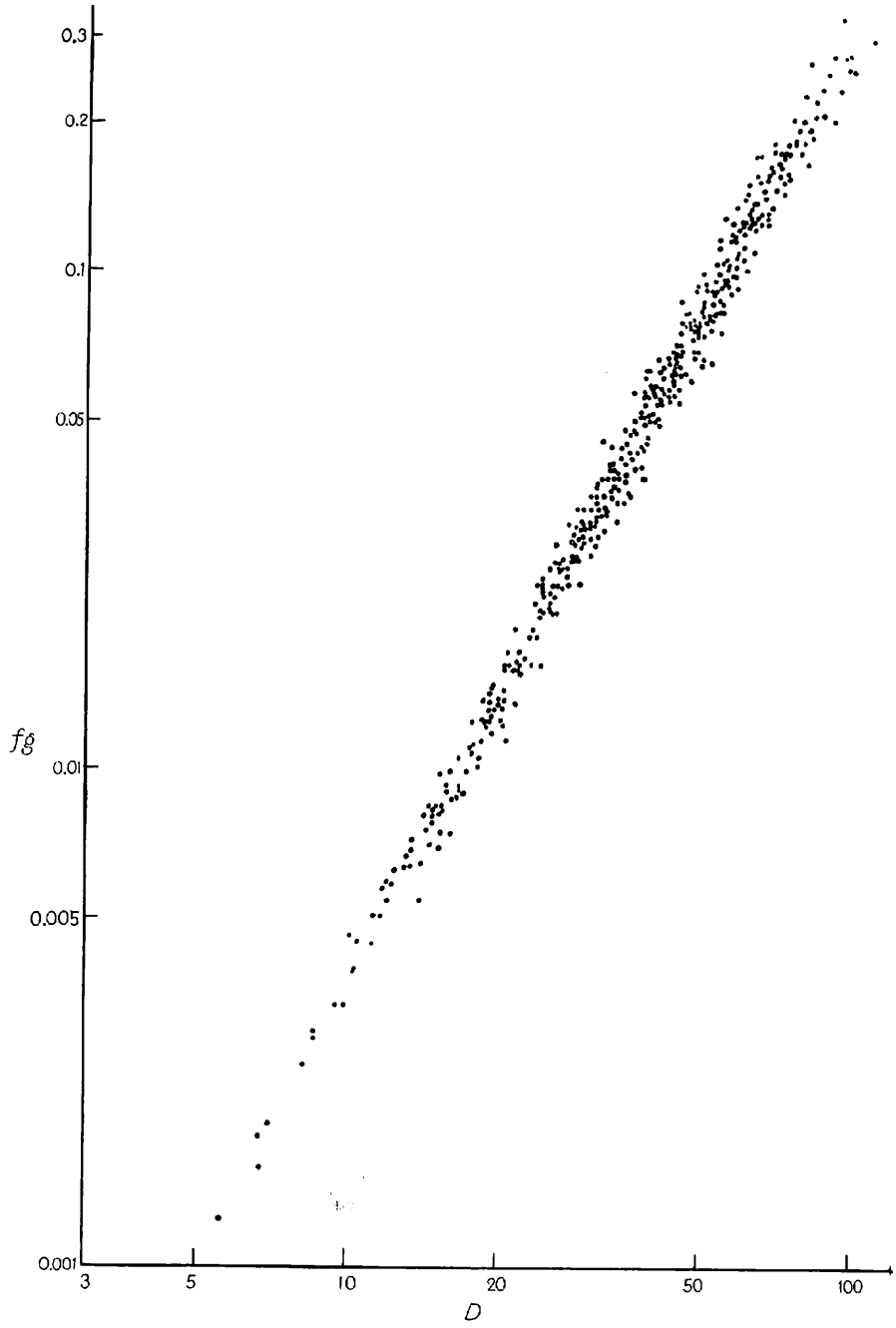

Fig. 1-iv　東京広葉樹　D : fg

Tokyo broad leaved tree　D : fg

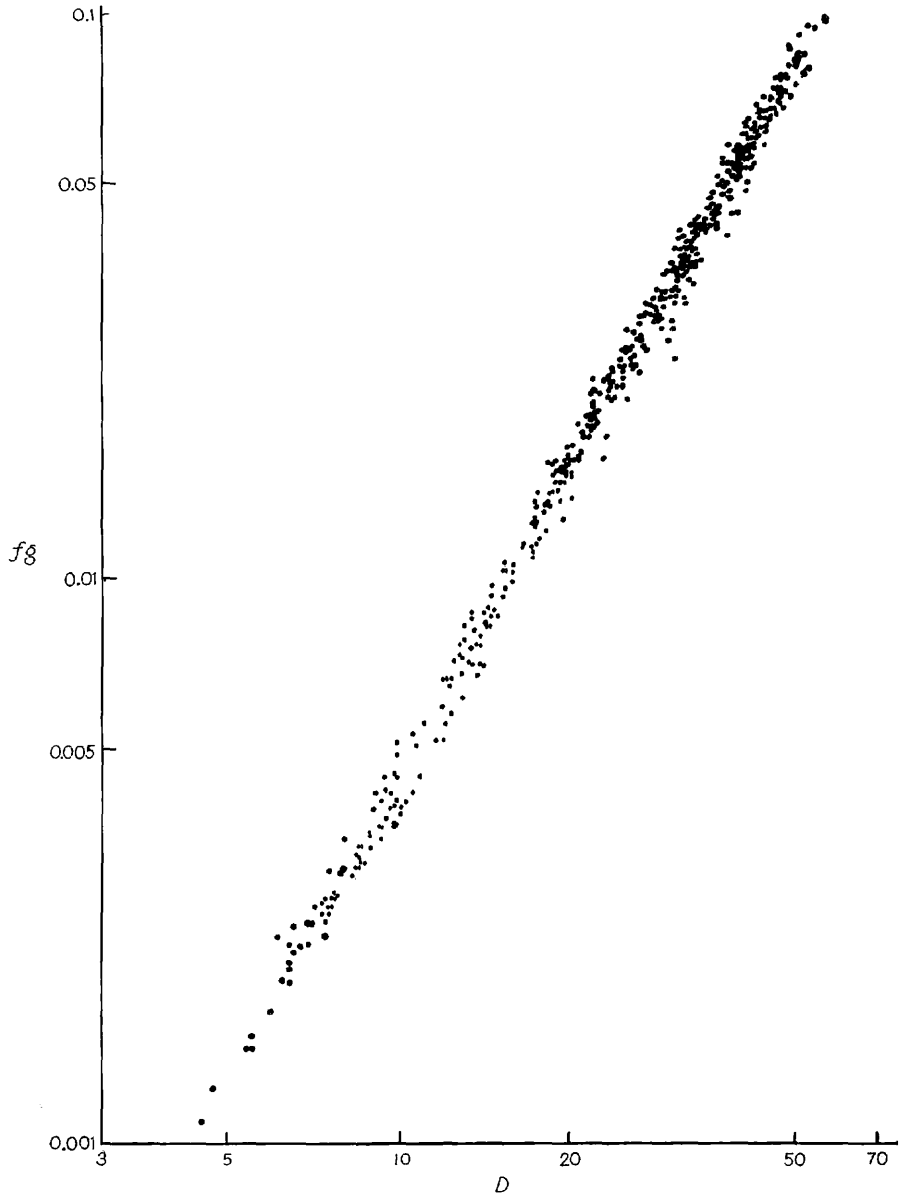

Fig. 1-v　前橋スギ　D : fg

Maebashi Sugi　D : fg

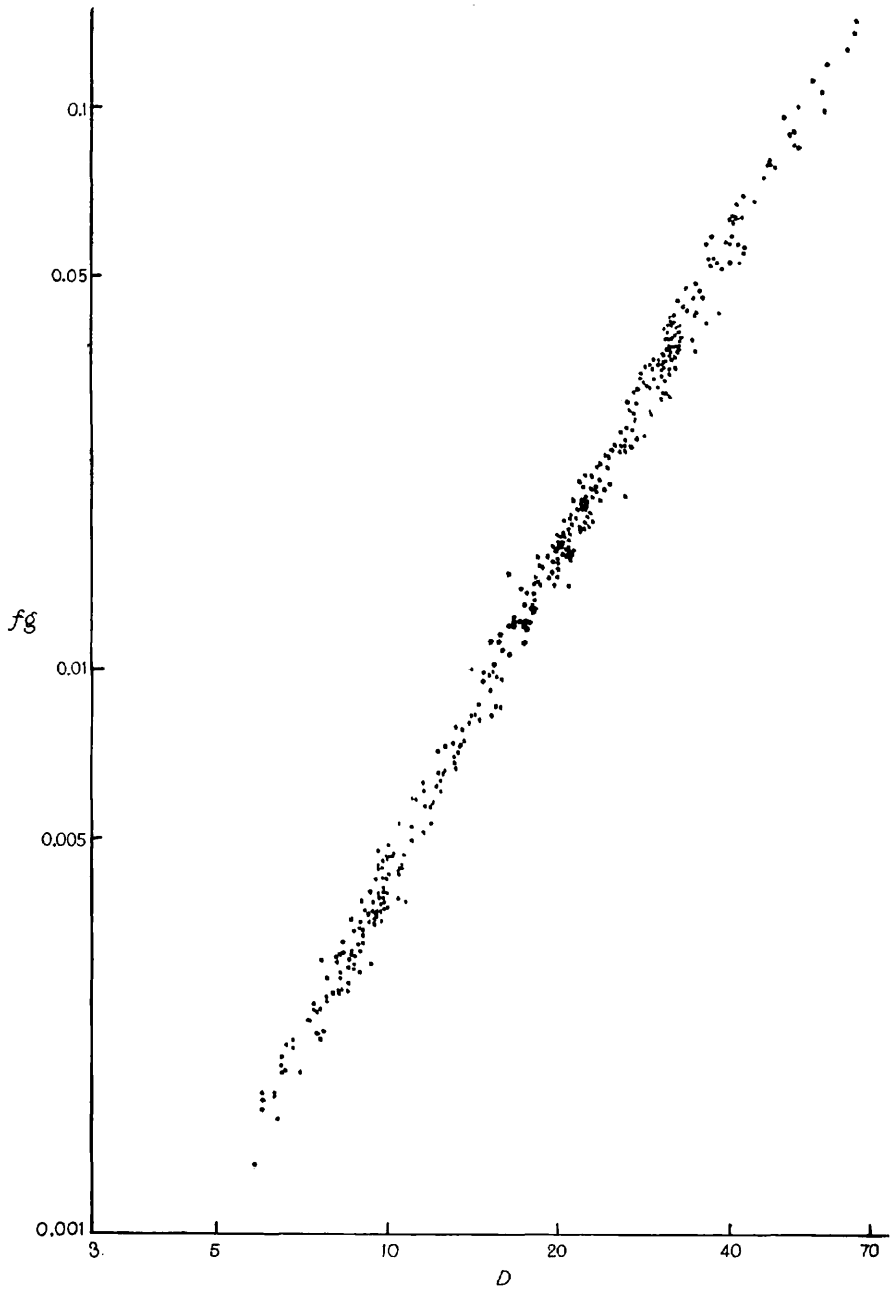

Fig. 1-vi　前橋ヒノキ　D : fg

Maebashi Hinoki　D : fg

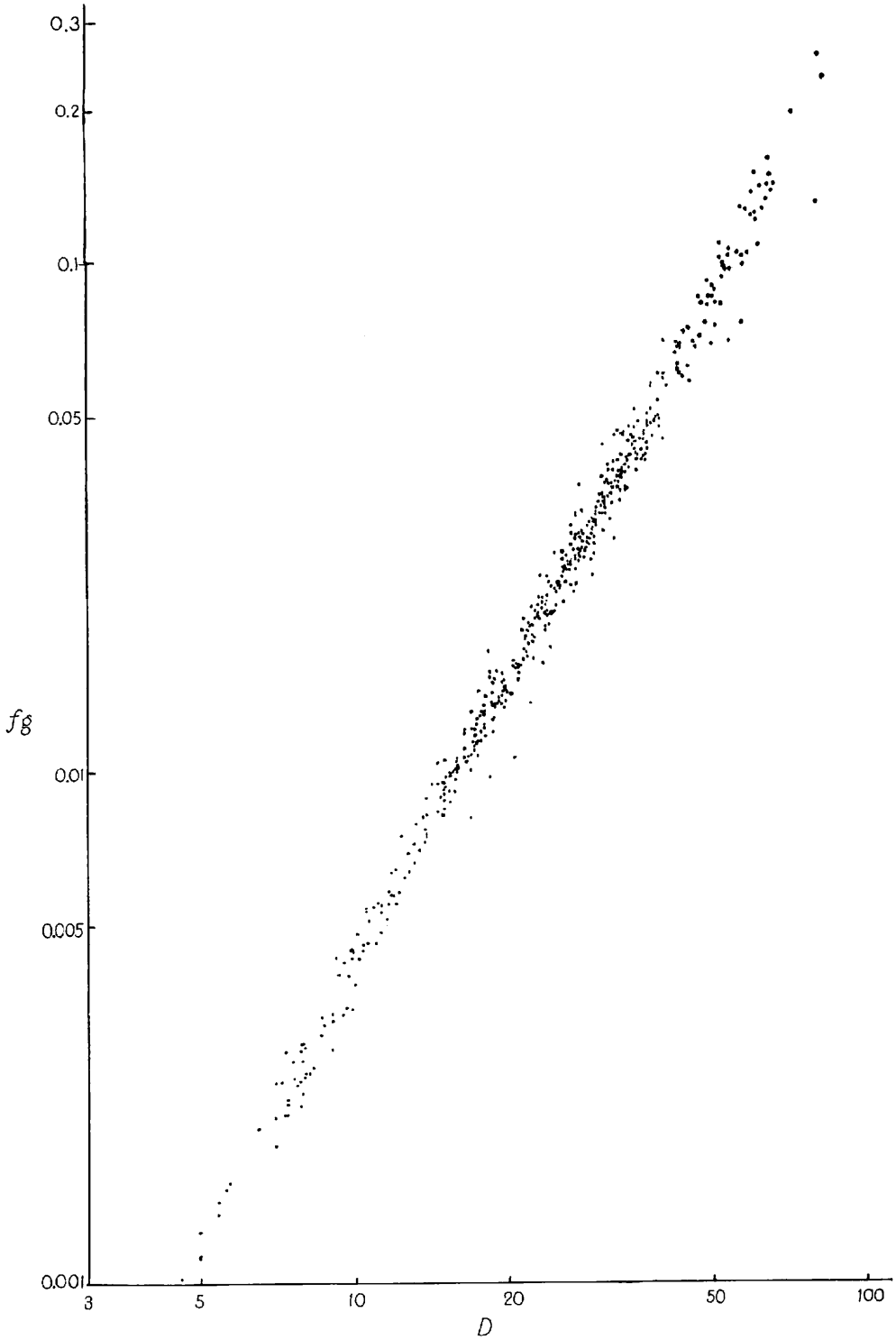

Fig. 1-vii　前橋アカマツ　D : fg

Maebashi Akamatsu　D : fg

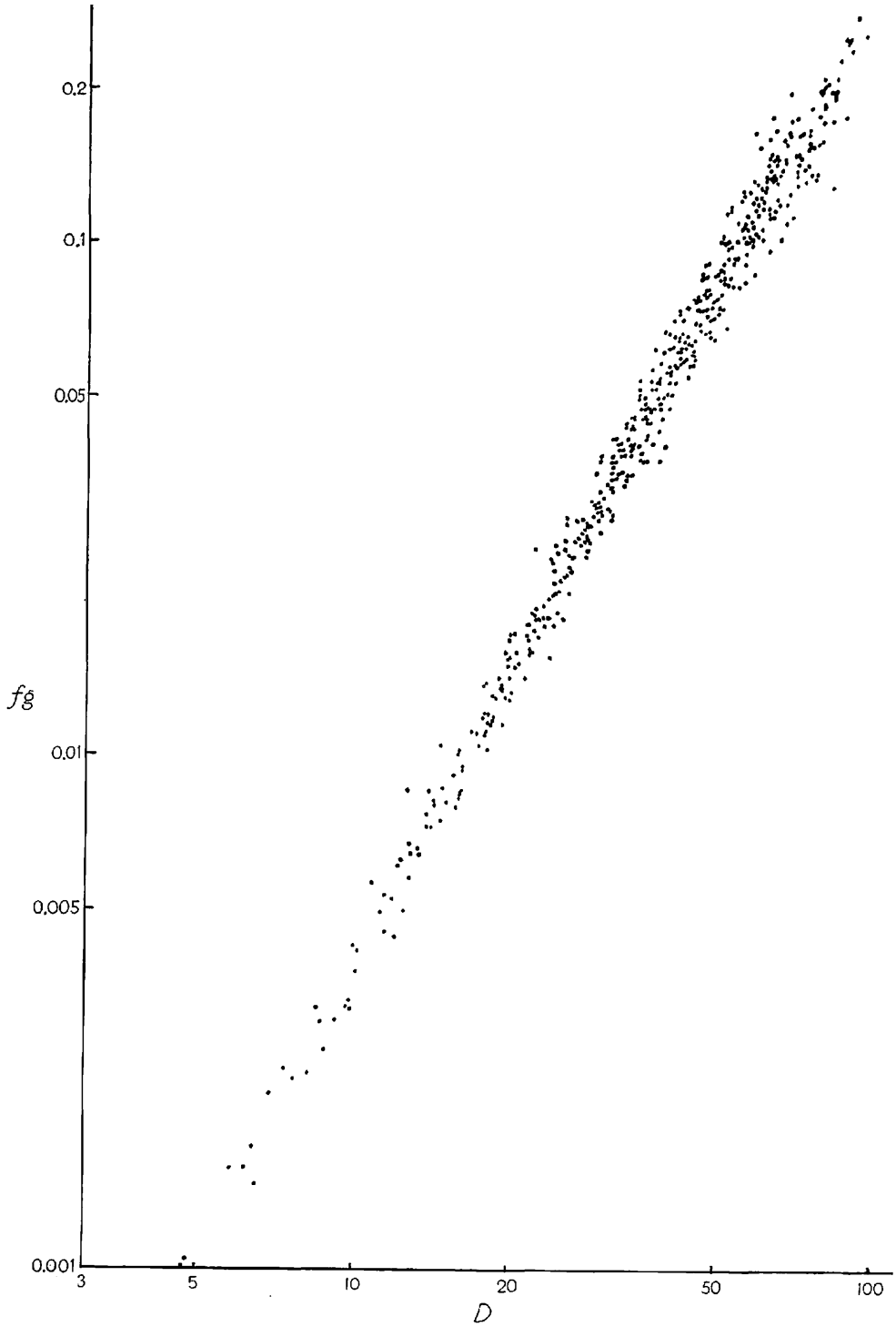

Fig. 1-viii　前橋広葉樹　D : fg
aebashi broad leaved tree　D : fg

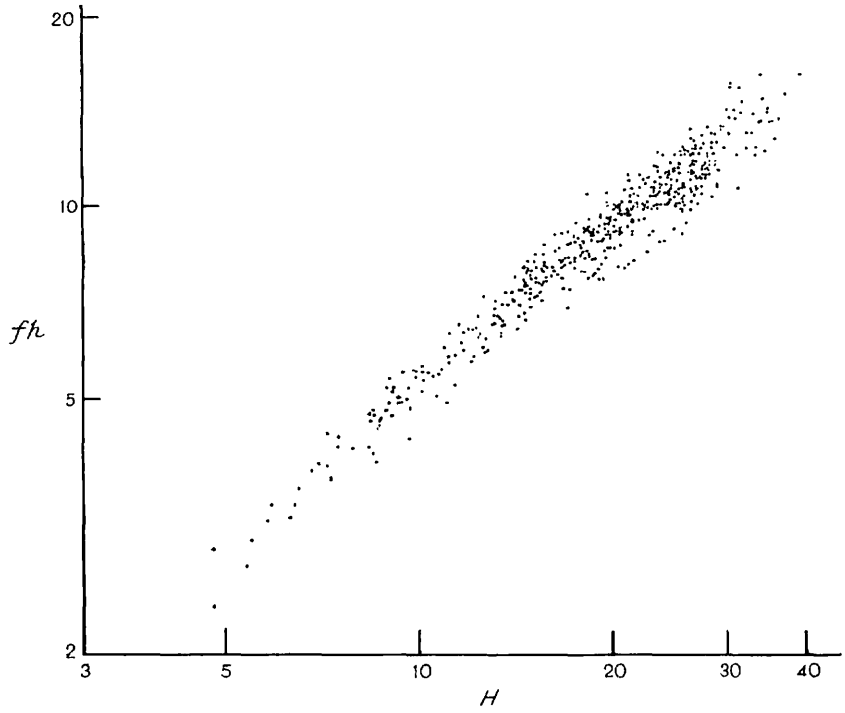

Fig. 2-i　東京スギ　H : fh
Tokyo Sugi　H : fh

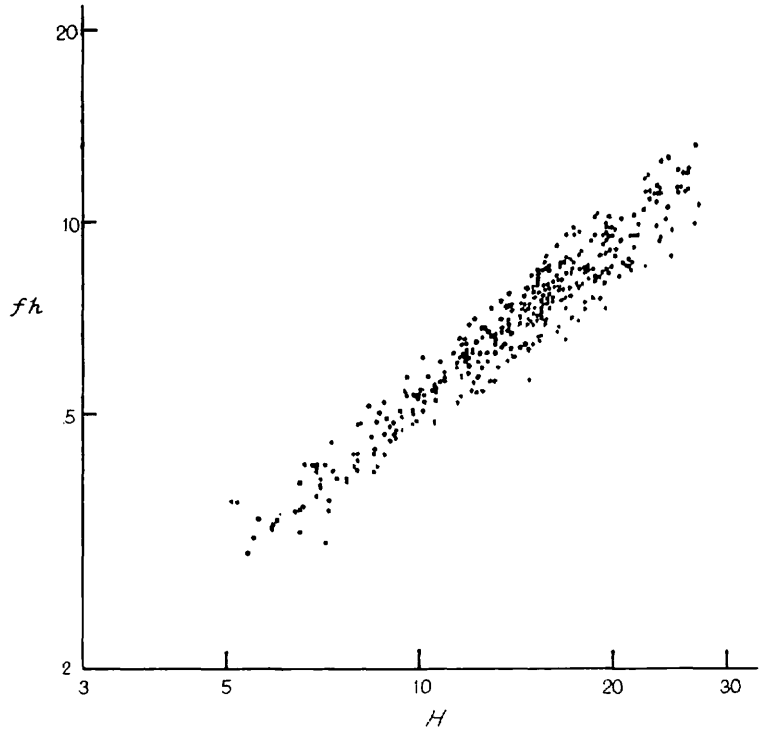

Fig. 2-ii　東京ヒノキ　H : fh
Tokyo Hinoki　H : fh

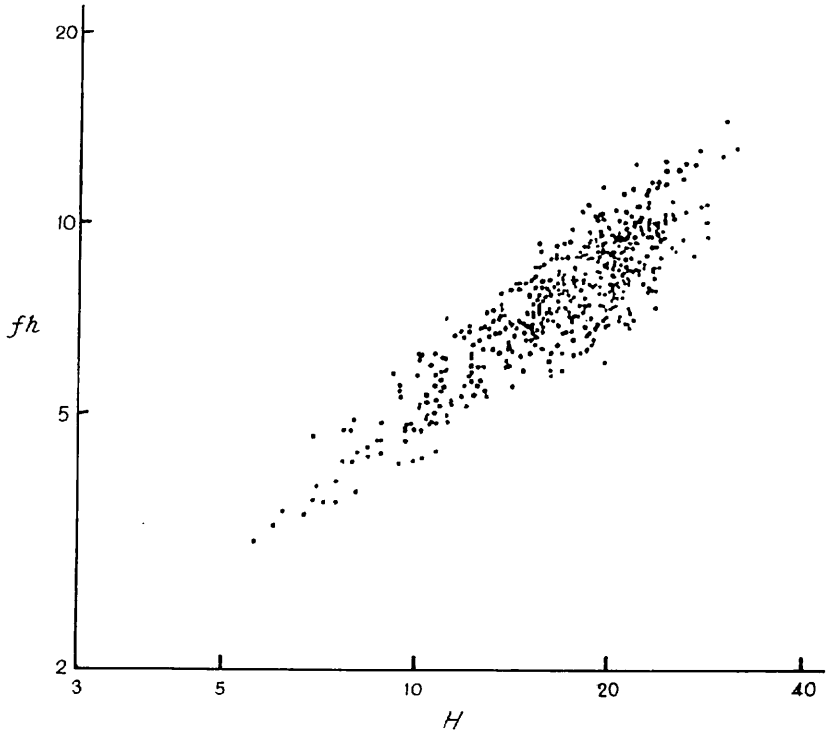

Fig. 2-iii　東京アカマツ　H : fh
Tokyo Akamatsu　H : fh

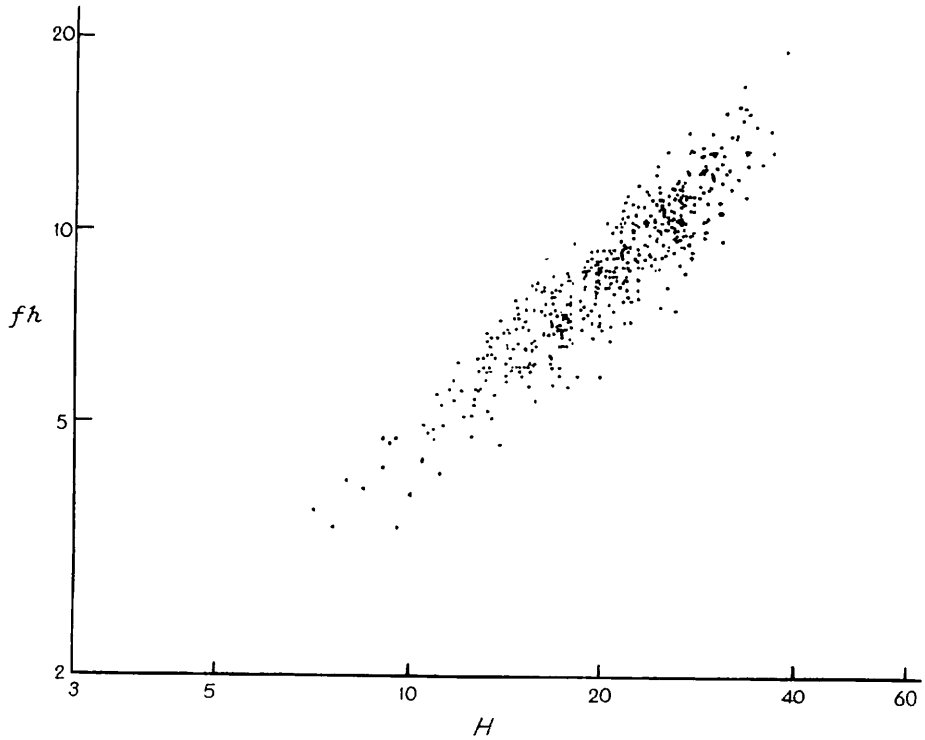

Fig. 2-iv　東京広葉樹　H : fh
Tokyo broad leaved tree　H : fh

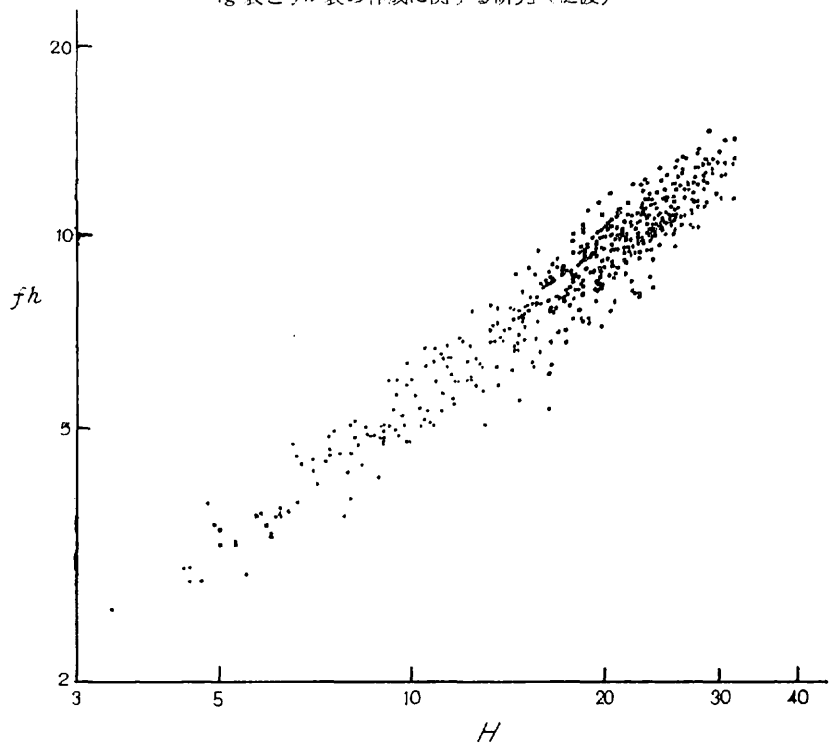

Fig. 2-v　前橋スギ　H : fh
Maebashi Sugi　H : fh

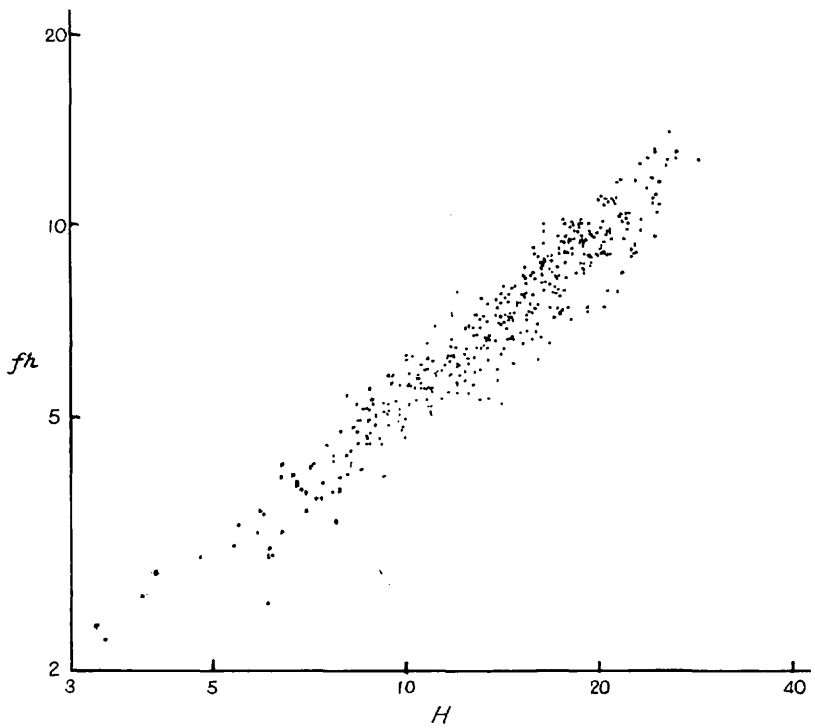

Fig. 2-vi　前橋ヒノキ　H : fh
Maebashi Hinoki　H : fh

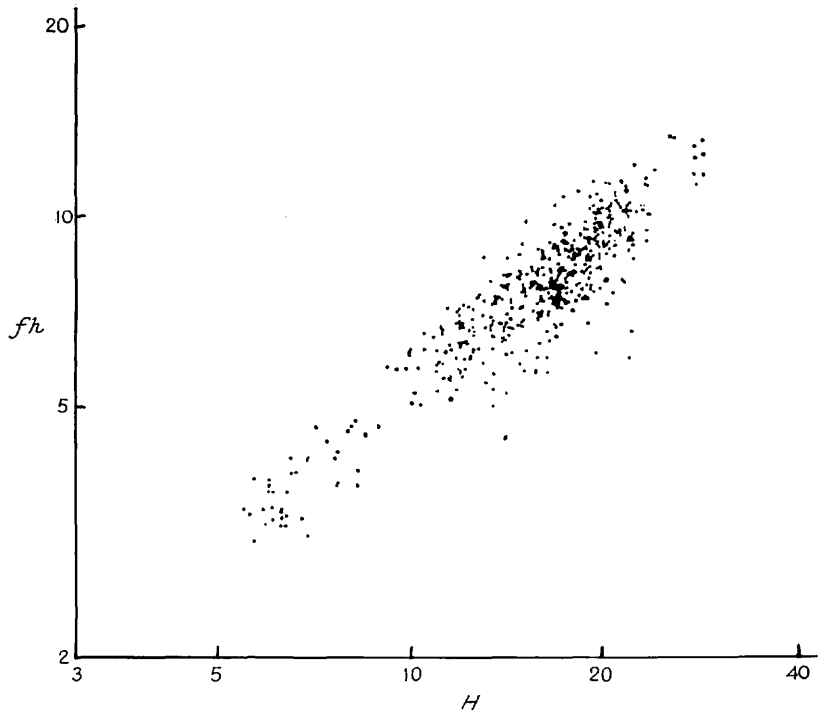

Fig. 2-vii　前橋アカマツ　H : fh
Maebashi Akamatsu　H : fh

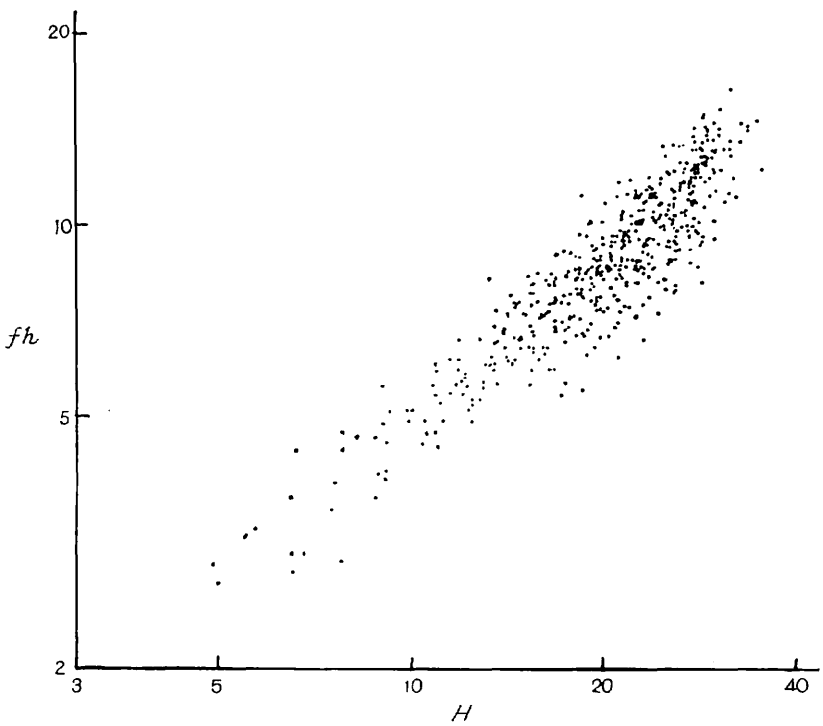

Fig. 2-viii　前橋広葉樹　H : fh
Maebashi broad leaved tree　H : fh

3. 修正係数（付録）と百分率誤差

以上の計算は対数によるので，推定値には誤差が含まれている。したがって，修正係数を求めて修正しなければならない。修正係数（f）は，

$$f=10^{1.151293\sigma^2} \qquad \sigma^2：誤差分散$$

で，近似的に計算される。すなわち，誤差分散を 1.151293 倍して真数にもどせばよい。また百分率誤差は，次の式から求めた。

$$百分率誤差(\%)=\left(\sqrt{\frac{\sum_{i=1}^{n}(Y_i-\hat{Y})^2}{n(n-k)}}\Big/\overline{Y}\right)\times 100$$

ここに，Y_i：個々の従属変量，$\hat{Y}$：従属変量の推定値

n：本数，k：変量の数，$\overline{Y}$：平均値，

修正係数と百分率誤差は Table 2 に示されている。

4. 推定式と *fg*，*fh* 表

修正係数により修正した推定式は，Table 3 のとおりである。

Table 3 の式を用いて推定した *fg*，*fh* は Table 4-i から Table 11-iii までに示されている。

なお，参考のために TOSBAC 3400 で計算したプログラムを掲上した。プログラムは 2 つにわかれており，1 つは，データを対数変換したあと，最小二乗法によって推定式と他の統計量を求めたもので，もう 1 つは，推定値計算である。

5. あ　と　が　き

表を作成する際，実験式を選定することと，従属変数に対して最も大きく作用する独立変数を選ぶことが大切である。2 の作成方法に示したように，*fh* は H に関係していることが知られているが，*fg* についても，大友が指摘したように，D に起因していることが，実証された。そしてこれらの変数を用いて回帰をあてはめ，*fg*，*fh* の推定値を求めたが，この表の作成によって，材積推定の計算が簡単に行なえるようになるので，今後表の利用が期待される。

文　　献

1) 大友栄松：森林調査におけるプロットレスサンプリングの理論的研究，林試研報，241，31～164，(1971)

2) スネデカー：統計的方法，p. 118，p. 376，(1963)

3) Thöni, H.: A Table for Estimating the Mean of a Lognormal Distribution. J. A. S. A. 64. 326，632～636，(1964)

Table 1. 樹種別，推定式別統計量
Statistics of each equations

局	樹種 Species	推定式 Equation	相関係数 Correlation coefficient	誤差分散 Variance	a	b	c	F
東京 Tokyō	スギ Sugi	$(fg)'=a+bD'$	0.9980	0.000828	−4.207635	1.839970		1.002
		$(fg)'=a+bD'+cH'$	0.9980	0.000827	−4.216520	1.821164	0.028089	
		$(fh)'=a+bH''$	0.9737	0.001072	−0.070684	0.795208		1.680**
		$(fh)'=a+bH''+cD''$	0.9798	0.000827	−0.111542	1.027941	−0.178749	
	ヒノキ Hinoki	$(fg)'=a+bD'$	0.9980	0.000917	−4.233627	1.861254		1.059
		$(fg)'=a+bD'+cH'$	0.9980	0.000891	−4.268564	1.813246	0.084634	
		$(fh)'=a+bH''$	0.9637	0.001254	−0.088207	0.808132		1.976**
		$(fh)'=a+bH''+cD''$	0.9744	0.000892	−0.163761	1.084708	−0.186743	
	アカマツ Akamatsu	$(fg)'=a+bD'$	0.9946	0.002089	−4.199794	1.825037		1.004
		$(fg)'=a+bD'+cH'$	0.9946	0.002085	−4.179810	1.839679	−0.033429	
		$(fh)'=a+bH''$	0.8878	0.002648	−0.027590	0.740833		1.615**
		$(fh)'=a+bH''+cD''$	0.9131	0.002084	−0.075074	0.966639	−0.160267	
	広葉樹 Broad leaved tree	$(fg)'=a+bD'$	0.9953	0.001976	−4.335194	1.910152		1.032
		$(fg)'=a+bD'+cH'$	0.9954	0.001945	−4.384644	1.875350	0.079140	
		$(fh)'=a+bH''$	0.9249	0.002238	−0.226795	0.890720		1.312**
		$(fh)'=a+bH''+cD''$	0.9352	0.001945	−0.280894	1.079783	−0.124472	
前橋 Maebashi	スギ Sugi	$(fg)'=a+bD'$	0.9974	0.001100	−4.155233	1.805782		1.073
		$(fg)'=a+bD'+cH'$	0.9975	0.001062	−4.184026	1.739567	0.096477	
		$(fh)'=a+bH''$	0.9637	0.001585	−0.025901	0.765349		2.252**
		$(fh)'=a+bH''+cD''$	0.9759	0.001056	−0.081053	1.094661	−0.257541	

ヒノキ Hinoki	$(fg)'=a+bD'$	0.9974	0.001270	−4.236460	1.869028			1.105
	$(fg)'=a+bD'+cH'$	0.9975	0.001208	−4.281447	1.807714	0.107462		
	$(fh)'=a+bH''$	0.9593	0.001719	−0.112160	0.838216			2.032**
	$(fh)'=a+bH''+cD''$	0.9717	0.001206	−0.176503	1.107562	−0.192392		
アカマツ Akamatsu	$(fg)'=a+bD'$	0.9918	0.003565	−4.211448	1.844109			0.996
	$(fg)'=a+bD'+cH'$	0.9918	0.003572	−4.215061	1.841128	0.006464		
	$(fh)'=a+bH''$	0.9141	0.002350	−0.060720	0.783902			1.483**
	$(fh)'=a+bH''+cD''$	0.9302	0.001930	−0.123076	1.006318	−0.147824		
広葉樹 Broad leaved tree	$(fg)'=a+bD'$	0.9942	0.002817	−4.277335	1.875948			0.999
	$(fg)'=a+bD'+cH'$	0.9942	0.002818	−4.264521	1.885629	−0.021435		
	$(fh)'=a+bH''$	0.9121	0.003163	−0.137312	0.825000			1.261**
	$(fh)'=a+bH''+cD''$	0.9223	0.002817	−0.159692	0.978592	−0.114347		

Table 2. 修正係数と百分率誤差

Corrected factor and percentage of error

局	樹種 Species	修正係数 Corrected factor			百分率誤差 (%) Percentage of error		
		$(fg)'=a+bD'$	$(fh)'=a+bH''$	$(fh)'=a+bH''+cD''$	$(fg)'=a+bD'$	$(fh)'=a+bH''$	$(fh)'=a+bH''+cD''$
東京 Tokyo	スギ Sugi	0.000951	0.001232	0.000950	0.49	0.38	0.32
	ヒノキ Hinoki	0.001053	0.001440	0.001024	0.53	0.45	0.35
	アカマツ Akamatsu	0.002400	0.003043	0.002394	0.72	0.56	0.50
	広葉樹 Broad leaved tree	0.002270	0.002571	0.002345	0.71	0.51	0.48
前橋 Maebashi	スギ Sugi	0.001264	0.001821	0.001213	0.38	0.41	0.32
	ヒノキ Hinoki	0.001458	0.001974	0.001385	0.62	0.50	0.40
	アカマツ Akamatsu	0.004096	0.002701	0.002218	0.91	0.51	0.46
	広葉樹 Broad leaved tree	0.003237	0.003634	0.003237	0.83	0.60	0.55

Table 3.　決定推定式
Final equations

局	樹種 Species	推定式 Equation
東京 Tokyo	スギ Sugi	$\log fg = -4.206684 + 1.839970 \log D$ $\log fh = -0.069452 + 0.795208 \log H$ $\log fh = -0.110592 + 1.027941 \log H - 0.178749 \log D$
	ヒノキ Hinoki	$\log fg = -4.232574 + 1.861254 \log D$ $\log fh = -0.086767 + 0.808132 \log H$ $\log fh = -0.162737 + 1.084708 \log H - 0.186743 \log D$
	アカマツ Akamatsu	$\log fg = -4.197394 + 1.825037 \log D$ $\log fh = -0.024547 + 0.740833 \log H$ $\log fh = -0.072680 + 0.966639 \log H - 0.160267 \log D$
	広葉樹 Broad leaved tree	$\log fg = -4.332924 + 1.910152 \log D$ $\log fh = -0.224224 + 0.890720 \log H$ $\log fh = -0.278659 + 1.079783 \log H - 0.124472 \log D$
前橋 Maebashi	スギ Sugi	$\log fg = -4.153969 + 1.805782 \log D$ $\log fh = -0.024080 + 0.765349 \log H$ $\log fh = -0.079840 + 1.094661 \log H - 0.257541 \log D$
	ヒノキ Hinoki	$\log fg = -4.235002 + 1.869028 \log D$ $\log fh = -0.110186 + 0.838216 \log H$ $\log fh = -0.175118 + 1.107562 \log H - 0.192392 \log D$
	アカマツ Akamatsu	$\log fg = -4.207352 + 1.844109 \log D$ $\log fh = -0.058020 + 0.763902 \log H$ $\log fh = -0.120859 + 1.006318 \log H - 0.147824 \log D$
	広葉樹 Broad leaved tree	$\log fg = -4.274098 + 1.875948 \log D$ $\log fh = -0.133678 + 0.825000 \log H$ $\log fh = -0.156455 + 0.978592 \log H - 0.114347 \log D$

Table 4-i.　東京スギ fg 表
Tokyo Sugi fg

$\log fg = -4.206684 + 1.839970 \log D$

D	FG	D	FG
2	0.0002	52	*0.0893*
4	0.0008	54	*0.0957*
6	*0.0017*	56	*0.1023*
8	*0.0029*	58	*0.1091*
10	*0.0043*	60	*0.1162*
12	*0.0060*	62	*0.1234*
14	*0.0080*	64	*0.1308*
16	*0.0102*	66	*0.1384*
18	*0.0127*	68	*0.1462*
20	*0.0154*	70	*0.1543*
22	*0.0183*	72	*0.1625*
24	*0.0215*	74	*0.1709*
26	*0.0249*	76	*0.1795*
28	*0.0286*	78	*0.1882*
30	*0.0324*	80	*0.1972*
32	*0.0365*	82	*0.2064*
34	*0.0409*	84	*0.2157*
36	*0.0454*	86	*0.2253*
38	*0.0501*	88	*0.2350*
40	*0.0551*	90	*0.2449*
42	*0.0603*	92	*0.2551*
44	*0.0657*	94	*0.2654*
46	*0.0712*	96	*0.2758*
48	*0.0771*	98	*0.2865*
50	*0.0831*	100	*0.2973*

注）イタリックはデータの範囲

Table 4-ii.　東京スギ fh 表
Tokyo Sugi fh

$\log fh = -0.069452 + 0.795208 \log H$

H	FH	H	FH
2	1.4789	21	*9.5937*
3	2.0415	22	*9.9553*
4	2.5663	23	*10.3135*
5	*3.0646*	24	*10.6685*
6	*3.5428*	25	*11.0205*
7	*4.0048*	26	*11.3696*
8	*4.4534*	27	*11.7160*
9	*4.8907*	28	*12.0598*
10	*5.3181*	29	*12.4011*
11	*5.7368*	30	*12.7399*
12	*6.1478*	31	*13.0765*
13	*6.5519*	32	*13.4108*
14	*6.9496*	33	*13.7430*
15	*7.3415*	34	*14.0732*
16	*7.7281*	35	*14.4014*
17	*8.1098*	36	*14.7276*
18	*8.4869*	37	*15.0520*
19	*8.8598*	38	*15.3746*
20	*9.2286*	39	*15.6955*
		40	*16.0147*

注）イタリックはデータの範囲

Table 4-iii. 東京スギ *fh* 表

Tokyo Sugi *fh*

$$\log fh = -0.111542 + 1.027941 \log H - 0.178749 \log D$$

H \ D	4	6	8	10	12	14	16	18	20
2	1.2338	1.1475	1.0900	1.0474					
3	1.8717	1.7409	1.6536	1.5890					
4	2.5158	2.3399	2.2226	2.1357	2.0672	2.0110			
5	3.1644	*2.9432*	2.7956	*2.6863*	2.6002	2.5295	2.4699	2.4184	
6	3.8167	*3.5498*	*3.3719*	*3.2401*	3.1362	3.0509	2.9790	2.9169	2.8625
7	4.4720	*4.1594*	*3.9509*	*3.7964*	3.6747	3.5748	3.4905	3.4178	3.3540
8	5.1300	4.7713	*4.5322*	*4.3549*	4.2153	4.1007	4.0040	3.9206	3.8475
9		5.3854	*5.1155*	*4.9155*	*4.7579*	*4.6285*	4.5194	4.4252	4.3427
10		6.0014	*5.7006*	*5.4777*	*5.3021*	*5.1580*	5.0363	4.9314	4.8394
11		6.6192	6.2874	*6.0416*	*5.8478*	*5.6889*	*5.5547*	*5.4390*	5.3375
12			6.8757	*6.6068*	*6.3950*	*6.2212*	*6.0745*	*5.9479*	*5.8369*
13			7.4653	7.1734	*6.9434*	*6.7547*	*6.5954*	*6.4580*	*6.3375*
14			8.0563	7.7413	7.4930	*7.2894*	*7.1175*	*6.9692*	*6.8392*
15			8.6484	8.3102	8.0437	*7.8251*	*7.6406*	*7.4814*	*7.3418*
16				8.8802	8.5955	*8.3619*	*8.1646*	*7.9945*	*7.8454*
17				9.4512	9.1482	8.8995	*8.6896*	*8.5086*	*8.3499*
18				10.0232	9.7016	9.4381	*9.2155*	*9.0235*	*8.8552*
19				10.5960	10.2563	9.9775	9.7422	9.5392	*9.3612*
20				11.1697	10.8115	10.5177	10.2696	10.0557	*9.8681*
21							10.7978	10.5729	10.3756
22							11.3267	11.0907	10.8838
23							11.8563	11.6093	11.3927
24							12.3865	12.1284	11.9022
25							12.9173	12.6482	12.4122
26									12.9229
27									13.4341
28									13.9458
29									14.4580
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

注）イタリックはデータの範囲

Table 4-iii. (つづき) (Continued)

H \ D	22	24	26	28	30	32	34	36	38
2									
3									
4									
5									
6	2.8141	2.7707	2.7313						
7	3.2973	3.2464	3.2003						
8	3.7825	3.7241	3.6712						
9	4.2693	4.2034	4.1437	4.0892	4.0391	3.9927	3.9497		
10	4.7577	4.6842	4.6177	4.5569	4.5011	4.4494	4.4015		
11	5.2474	5.1664	5.0930	5.0260	4.9644	4.9074	4.8545	4.8052	4.7590
12	*5.7383*	5.6498	5.5695	5.4962	5.4289	5.3666	5.3088	5.2548	5.2043
13	*6.2305*	6.1343	6.0472	5.9676	5.8944	5.8268	5.7640	5.7054	5.6506
14	*6.7236*	6.6199	6.5258	*6.4399*	6.3610	6.2881	6.2203	6.1571	6.0978
15	*7.2178*	*7.1064*	*7.0054*	*6.9133*	6.8285	6.7502	6.6774	6.6096	6.5460
16	*7.7129*	*7.5938*	*7.4860*	*7.3874*	7.2969	*7.2132*	7.1355	7.0629	6.9950
17	*8.2088*	*8.0821*	*7.9673*	*7.8625*	*7.7661*	*7.6770*	*7.5943*	7.5171	7.4448
18	*8.7056*	*8.5712*	*8.4495*	*8.3383*	*8.2361*	*8.1416*	*8.0539*	7.9720	7.8953
19	*9.2031*	*9.0611*	*8.9324*	*8.8148*	*8.7068*	*8.6069*	*8.5141*	*8.4276*	8.3465
20	*9.7014*	*9.5517*	*9.4160*	*9.2921*	*9.1782*	*9.0729*	*8.9751*	*8.8839*	*8.7984*
21	10.2003	*10.0429*	*9.9003*	*9.7700*	*9.6502*	*9.5395*	*9.4367*	*9.3408*	*9.2510*
22	10.7000	10.5348	*10.3852*	*10.2485*	*10.1229*	*10.0068*	*9.8990*	*9.7983*	*9.7041*
23	11.2002	11.0274	*10.8707*	*10.7277*	*10.5962*	*10.4747*	*10.3618*	*10.2564*	*10.1578*
24	11.7011	11.5205	11.3569	*11.2074*	*11.0701*	*10.9431*	*10.8251*	*10.7151*	*10.6120*
25	12.2026	12.0142	11.8436	*11.6877*	*11.5445*	*11.4121*	*11.2891*	*11.1743*	*11.0668*
26	12.7046	12.5085	12.3308	*12.1686*	12.0194	*11.8816*	*11.7535*	*11.6340*	*11.5221*
27	13.2071	13.0033	12.8186	*12.6499*	12.4949	*12.3516*	*12.2184*	*12.0942*	*11.9779*
28	13.7102	13.4986	13.3069	*13.1318*	12.9708	*12.8220*	*12.6838*	*12.5549*	*12.4342*
29	14.2138	13.9944	13.7956	13.6141	13.4472	13.2930	13.1497	13.0161	*12.8909*
30			14.2849	14.0969	13.9241	13.7644	13.6161	13.4776	*13.3480*
31						14.2363	14.0828	13.9397	*13.8056*
32						14.7085	14.5500	14.4021	*14.2636*
33						15.1812	15.0176	14.8649	14.7220
34									
35									
36									
37									
38									
39									
40									
41									

40	42	44	46	48	50	52	54	56	58
4.7155	4.6746	4.6359							
5.1568	5.1120	5.0696							
5.5990	5.5504	5.5044							
6.0422	5.9897	5.9401	5.8931						
6.4863	6.4299	6.3767	6.3262	6.2783	6.2326				
6.9312	6.8710	6.8141	6.7601	6.7089	6.6601	6.6136	6.5691		
7.3768	7.3128	7.2522	7.1948	7.1403	7.0884	7.0389	6.9916	6.9462	6.9028
7.8233	7.7553	7.6911	7.6302	7.5724	7.5174	7.4648	7.4147	7.3666	7.3205
8.2704	*8.1986*	*8.1307*	8.0663	8.0052	7.9470	7.8915	7.8384	7.7876	7.7389
8.7181	*8.6424*	*8.5709*	8.5030	*8.4386*	8.3772	8.3187	8.2628	8.2092	8.1579
9.1665	*9.0869*	*9.0117*	8.9404	*8.8726*	*8.8081*	8.7466	8.6878	8.6315	8.5775
9.6155	*9.5320*	*9.4531*	*9.3783*	*9.3072*	*9.2395*	9.1750	9.1133	9.0543	8.9976
10.0651	*9.9777*	*9.8951*	*9.8168*	*9.7424*	*9.6715*	9.6040	9.5394	9.4776	9.4183
10.5152	*10.4239*	*10.3376*	*10.2558*	*10.1780*	*10.1040*	10.0334	9.9660	9.9014	9.8395
10.9658	*10.8706*	*10.7806*	*10.6953*	*10.6142*	*10.5370*	10.4634	10.3931	10.3257	10.2612
11.4170	*11.3178*	*11.2241*	*11.1353*	*11.0509*	*10.9705*	*10.8939*	*10.8207*	*10.7505*	10.6833
11.8686	*11.7655*	*11.6681*	*11.5758*	*11.4880*	*11.4045*	*11.3248*	*11.2487*	*11.1758*	11.1059
12.3207	*12.2137*	*12.1126*	*12.0167*	*11.9256*	*11.8389*	*11.7562*	*11.6772*	*11.6015*	11.5290
12.7732	*12.6623*	*12.5575*	*12.4581*	*12.3637*	*12.2738*	*12.1880*	*12.1061*	*12.0276*	*11.9524*
13.2262	*13.1114*	*13.0028*	12.8999	*12.8021*	*12.7090*	*12.6202*	*12.5354*	*12.4542*	*12.3763*
13.6796	*13.5608*	*13.4485*	13.3421	*13.2410*	*13.1447*	*13.0529*	*12.9651*	*12.8811*	*12.8006*
14.1334	*14.0107*	*13.8947*	13.7847	*13.6802*	13.5808	*13.4859*	*13.3952*	*13.3084*	*13.2252*
14.5876	14.4609	*14.3412*	14.2277	*14.1199*	14.0172	*13.9193*	*13.8257*	13.7361	*13.6502*
	14.9116	*14.7881*	14.6711	14.5599	14.4540	*14.3531*	*14.2566*	14.1642	14.0756
			15.1148	15.0003	14.8912	14.7872	*14.6878*	14.5926	14.5015
					15.3287	15.2216	15.1193	15.0213	14.9274
							15.5512	15.4504	15.3538
									15.7805

Table 4-iii. (つづき) (Continued)

H \ D	60	62	64	66	68	70	72	74	76
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18	7.2763	7.2338	7.1929						
19	7.6922	7.6472	7.6039	7.5622	7.5220				
20	8.1086	8.0612	8.0156	7.9717	7.9292	7.8883	7.8486	7.8103	
21	8.5257	8.4759	8.4279	8.3817	8.3371	8.2940	8.2523	8.2120	8.1729
22	8.9433	8.8910	8.8407	8.7922	8.7454	8.7002	8.6565	8.6142	8.5733
23	9.3614	9.3067	9.2540	9.2033	9.1543	9.1070	9.0612	9.0170	8.9741
24	9.7801	9.7229	9.6679	9.6148	9.5637	9.5142	9.4665	9.4202	9.3754
25	10.1992	10.1396	10.0822	10.0269	9.9735	9.9220	9.8721	9.8239	9.7772
26	10.6188	10.5567	10.4970	10.4394	10.3838	10.3302	10.2783	10.2281	10.1794
27	*11.0388*	10.9743	10.9122	10.8524	10.7946	10.7388	10.6849	10.6327	10.5821
28	*11.4593*	11.3923	11.3279	11.2657	11.2058	11.1479	11.0919	11.0377	10.9852
29	*11.8802*	11.8108	11.7439	11.6795	11.6174	11.5573	*11.4993*	11.4431	11.3887
30	*12.3015*	12.2296	12.1604	12.0937	12.0294	11.9672	11.9071	11.8489	11.7926
31	*12.7232*	12.6489	12.5773	12.5083	12.4417	12.3774	12.3153	12.2551	12.1968
32	*13.1453*	13.0685	12.9945	12.9233	12.8545	12.7880	12.7238	12.6616	12.6014
33	*13.5678*	13.4885	13.4121	13.3386	13.2676	13.1990	13.1327	13.0686	13.0064
34	*13.9906*	13.9088	13.8301	13.7542	13.6810	13.6103	13.5420	13.4758	*13.4117*
35	*14.4137*	14.3295	14.2484	14.1702	14.0948	14.0220	13.9516	13.8834	13.8174
36	*14.8372*	14.7505	14.6670	*14.5866*	14.5090	14.4340	14.3615	14.2913	14.2233
37	*15.2610*	15.1719	15.0860	*15.0032*	14.9234	14.8463	14.7717	14.6995	14.6296
38	15.6852	15.5935	15.5053	*15.4202*	15.3382	15.2589	15.1823	15.1081	15.0362
39		16.0155	15.9249	*15.8375*	15.7532	15.6718	15.5931	15.5169	15.4431
40				16.2551	16.1686	16.0850	16.0042	15.9260	15.8503
41									

78	80	82	84
8.1351	8.0983	8.0627	8.0280
8.5335	8.4950	8.4576	8.4213
8.9325	8.8922	8.8530	8.8150
9.3320	9.2898	9.2489	9.2092
9.7319	9.6880	9.6453	9.6038
10.1323	10.0865	10.0421	9.9989
10.5331	10.4855	10.4393	10.3945
10.9343	10.8849	10.8370	10.7904
11.3359	11.2847	11.2350	11.1868
11.7379	11.6849	11.6335	11.5835
12.1403	12.0855	12.0323	11.9806
12.5431	12.4864	12.4314	12.3780
12.9462	12.8877	12.8309	12.7758
13.3496	13.2893	13.2308	13.1739
13.7534	13.6913	*13.6310*	13.5724
14.1575	14.0935	14.0315	13.9712
14.5619	14.4961	14.4323	14.3702
14.9666	14.8990	14.8334	14.7696
15.3716	15.3022	15.2348	15.1693
15.7769	15.7056	15.6365	15.5693

Table 5-i. 東京ヒノキ *fg* 表

$\log fg = -4.232574 + 1.861254 \log D$

D	*FG*	*D*	*FG*
2	0.0002	52	*0.0915*
4	*0.0008*	54	*0.0981*
6	*0.0016*	56	*0.1050*
8	*0.0028*	58	0.1121
10	*0.0043*	60	0.1194
12	*0.0060*	62	0.1269
14	*0.0080*	64	0.1346
16	*0.0102*	66	0.1426
18	*0.0127*	68	0.1507
20	*0.0155*	70	0.1591
22	*0.0185*	72	0.1677
24	*0.0217*	74	0.1764
26	*0.0252*	76	0.1854
28	*0.0289*	78	0.1946
30	*0.0329*	80	0.2040
32	*0.0371*	82	0.2136
34	*0.0415*	84	0.2234
36	*0.0461*	86	0.2334
38	*0.0510*	88	0.2436
40	*0.0561*	90	0.2540
42	*0.0615*	92	0.2646
44	*0.0670*	94	0.2754
46	*0.0728*	96	0.2864
48	*0.0788*	98	0.2976
50	*0.0850*	100	0.3090

注）イタリックはデータの範囲

Table 5-ii. 東京ヒノキ *fh* 表

$\log fh = -0.086767 + 0.808132 \log H$

D	*FH*	*D*	*FH*
2	1.4339	21	*9.5887*
3	1.9898	22	*9.9561*
4	2.5106	23	*10.3202*
5	*3.0067*	24	*10.6813*
6	*3.4840*	25	*11.0396*
7	*3.9462*	26	*11.3951*
8	*4.3959*	27	*11.7480*
9	*4.8349*	28	12.0984
10	*5.2646*	29	12.4464
11	*5.6861*	30	12.7921
12	*6.1003*	31	13.1356
13	*6.5080*	32	13.4770
14	*6.9097*	33	13.8163
15	*7.3058*	34	14.1537
16	*7.6970*	35	14.4892
17	*8.0835*	36	14.8228
18	*8.4656*	37	15.1547
19	*8.8437*	38	15.4848
20	*9.2180*	39	15.8133
		40	16.1402

注）イタリックはデータの範囲

Table 5-iii.　東　京　ヒ

$\log fh = -0.162737 + 1.084708 \log H$

H \ D	4	6	8	10	12	14	16	18	20
2	1.1255	1.0435	0.9889	0.9485					
3	1.7473	1.6199	1.5352	1.4725					
4	2.3872	2.2131	2.0974	2.0118	1.9444	1.8893			
5	3.0410	*2.8192*	2.6718	2.5627	2.4769	2.4066	2.3474	2.2963	
6	3.7060	*3.4357*	*3.2560*	3.1231	3.0186	2.9329	2.8607	2.7984	2.7439
7	*4.3804*	*4.0610*	*3.8486*	*3.6915*	3.5679	3.4667	3.3813	3.3078	3.2433
8	5.0632	*4.6939*	*4.4484*	*4.2669*	*4.1240*	4.0070	3.9083	3.8233	3.7488
9		*5.3336*	*5.0547*	*4.8484*	*4.6861*	*4.5531*	4.4410	4.3443	4.2597
10		5.9794	*5.6666*	*5.4354*	*5.2534*	*5.1043*	4.9786	*4.8703*	4.7754
11		6.6306	*6.2838*	*6.0274*	*5.8256*	*5.6603*	*5.5209*	*5.4008*	5.2956
12			*6.9058*	*6.6239*	*6.4022*	*6.2205*	*6.0673*	*5.9354*	*5.8197*
13			7.5322	7.2248	6.9829	*6.7848*	*6.6177*	*6.4737*	*6.3476*
14			8.1627	7.8295	7.5674	*7.3527*	*7.1716*	*7.0156*	*6.8789*
15			8.7970	8.4379	8.1555	*7.9241*	*7.7289*	*7.5608*	*7.4135*
16				9.0498	8.7469	*8.4987*	*8.2894*	*8.1090*	*7.9510*
17				9.6649	9.3414	*9.0763*	8.8528	*8.6602*	*8.4915*
18				10.2831	9.9389	9.6569	9.4190	*9.2141*	*9.0346*
19				10.9042	10.5392	10.2401	9.9880	9.7707	*9.5803*
20				11.5281	11.1422	10.8260	10.5594	10.3297	*10.1284*
21							11.1333	10.8911	10.6789
22							11.7095	11.4548	11.2316
23							12.2879	12.0206	11.7864
24							12.8685	12.5886	12.3433
25							13.4511	13.1585	12.9021
26									13.4629
27									14.0254
28									14.5898
29									15.1558
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

注）イタリックはデータの範囲

ノ　キ　*fh*　表

$-0.186743 \log D$

22	24	26	28	30	32	34	36	38	40
2.6955	2.6521	2.6127							
2.1861	3.1348	3.0882							
3.6827	3.6233	3.5696							
4.1846	4.1171	4.0560	4.0003	3.9491	3.9018	3.8578			
4.6912	4.6156	4.5471	4.4846	4.4272	4.3742	4.3249			
5.2021	5.1183	5.0424	4.9731	4.9094	4.8506	4.7960	4.7451	4.6974	4.6526
5.7170	5.6249	5.5415	5.4653	5.3953	5.3307	5.2707	5.2147	5.1623	5.1131
6.2356	6.1351	6.0441	*5.9610*	5.8847	5.8142	5.7488	5.6877	5.6306	5.5769
6.7576	*6.6486*	*6.5500*	*6.4600*	6.3773	*6.3009*	6.2300	6.1638	6.1019	6.0437
7.2827	*7.1653*	*7.0590*	*6.9620*	*6.8728*	*6.7905*	*6.7141*	*6.6428*	6.5761	6.5134
7.8108	*7.6849*	*7.5709*	*7.4668*	*7.3712*	*7.2829*	*7.2009*	*7.1245*	7.0529	6.9857
8.3417	*8.2072*	*8.0855*	*7.9743*	*7.8723*	*7.7779*	*7.6904*	*7.6087*	7.5323	*7.4605*
8.8752	*8.7322*	*8.6026*	*8.4844*	*8.3758*	*8.2754*	*8.1823*	*8.0954*	*8.0141*	*7.9377*
9.4113	*9.2596*	*9.1222*	*8.9969*	*8.8817*	*8.7753*	*8.6765*	*8.5844*	*8.4981*	*8.4171*
9.9498	*9.7894*	*9.6442*	*9.5116*	*9.3899*	*9.2774*	*9.1729*	*9.0755*	*8.9844*	*8.8987*
10.4905	10.3214	10.1683	*10.0286*	*9.9002*	*9.7816*	*9.6715*	*9.5688*	*9.4727*	*9.3823*
11.0335	10.8556	10.6946	*10.5476*	*10.4126*	*10.2878*	*10.1720*	*10.0640*	*9.9629*	*9.8679*
11.5785	11.3919	11.2229	*11.0686*	*10.9269*	*10.7960*	10.6745	*10.5612*	*10.4551*	*10.3554*
12.1255	11.9301	11.7531	11.5916	*11.4432*	*11.3061*	11.1788	*11.0601*	*10.9490*	*10.8447*
12.6745	12.4702	12.2852	12.1164	11.9613	11.8180	11.6850	11.5609	*11.4448*	*11.3356*
13.2254	13.0122	12.8192	12.6430	12.4811	12.3316	12.1928	12.0633	*11.9422*	*11.8283*
13.7780	13.5560	13.3548	13.1713	13.0027	12.8469	12.7023	12.5674	12.4412	12.3226
14.3324	14.1014	13.8922	13.7013	13.5259	13.3638	13.2134	13.0731	12.9418	12.8184
14.8885	14.6485	14.4312	14.2328	14.0506	13.8823	13.7260	13.5803	13.4439	13.3157
		14.9717	14.7660	14.5769	14.4023	14.2402	14.0890	13.9475	13.8145
					14.9238	14.7558	14.5991	14.4525	14.3147
					15.4467	15.2728	15.1106	14.9588	14.8162
					15.9710	15.7912	15.6235	15.4666	15.3191

Table 5-iii. (つづき)

H \ D	42	44	46	48	50	52	54	56	58
2									
3									
4									
5									
6									
7									
8									
9									
10									
11	4.6104	4.5705							
12	5.0668	5.0229							
13	5.5263	5.4785							
14	5.9889	5.9371	5.8880						
15	*6.4543*	6.3985	6.3456	6.2953	6.2475				
16	*6.9223*	6.8624	6.8057	6.7518	6.7006	6.6517	6.6049		
17	*7.3928*	*7.3289*	7.2683	7.2108	7.1560	7.1038	7.0539	7.0061	6.9604
18	*7.8657*	*7.7977*	7.7332	7.6720	7.6137	7.5582	7.5051	7.4543	7.4056
19	*8.3408*	*8.2686*	*8.2003*	8.1354	8.0736	8.0147	7.9584	7.9045	7.8529
20	*8.8180*	*8.7417*	*8.6695*	8.6008	8.5355	8.4732	8.4137	8.3568	8.3022
21	*9.2973*	*9.2168*	*9.1406*	*9.0683*	*8.9994*	8.9337	8.8710	8.8110	8.7534
22	*9.7784*	*9.6939*	*9.6137*	*9.5376*	*9.4652*	9.3961	9.3301	9.2670	9.2064
23	*10.2615*	*10.1727*	*10.0886*	*10.0088*	*9.9328*	9.8603	9.7910	9.7247	9.6612
24	*10.7463*	*10.6533*	*10.5653*	*10.4816*	*10.4020*	10.3261	10.2536	10.1842	10.1177
25	*11.2328*	*11.1357*	*11.0436*	*10.9562*	*10.8730*	10.7936	*10.7178*	10.6453	10.5758
26	11.7210	*11.6196*	*11.5236*	11.4324	*11.3455*	11.2628	*11.1837*	11.1080	11.0354
27	12.2108	*12.1052*	*12.0051*	11.9101	11.8196	11.7334	11.6510	*11.5721*	11.4965
28	12.7021	12.5923	12.4882	12.3893	12.2952	12.2055	12.1198	12.0377	11.9591
29	13.1949	13.0808	12.9727	12.8700	12.7722	12.6790	12.5900	12.5048	12.4231
30	13.6892	13.5708	13.4586	13.3521	13.2507	13.1540	13.0616	12.9732	12.8884
31	14.1848	14.0622	13.9459	13.8355	13.7304	13.6302	13.5345	13.4429	13.3551
32	14.6819	14.5549	14.4345	14.3203	14.2115	14.1078	14.0087	13.9139	13.8230
33	15.1802	15.0489	14.9245	14.8063	14.6939	14.5867	14.4842	14.3862	14.2922
34	15.6798	15.5442	15.4157	15.2936	15.1775	15.0667	14.9609	14.8597	14.7626
35			15.9081	15.7821	15.6623	15.5480	15.4388	15.3343	15.2342
36					16.1483	16.0304	15.9179	15.8101	15.7068
37							16.3980	16.2870	16.1807
38									16.6556
39									
40									

60	62	64	66	68	70	72	74	76	78
7.3589	7.3139	7.2707							
7.8033	7.7557	7.7099	7.6657	7.6231					
8.2498	8.1994	8.1510	8.1043	8.0592	8.0157	7.9736	7.9330		
8.6982	8.6451	8.5940	8.5447	8.4972	8.4513	8.4070	8.3641	8.3225	8.2823
9.1483	9.0925	9.0388	8.9870	8.9370	8.8888	8.8421	8.7970	8.7533	8.7109
9.6003	9.5417	9.4853	9.4300	9.3785	9.3278	9.2789	9.2315	9.1857	9.1412
10.0538	9.9925	9.9334	9.8765	9.8216	9.7686	9.7173	9.6677	9.6197	9.5731
10.5090	10.4449	10.3831	10.3236	10.2662	10.2108	10.1572	10.1054	10.0552	10.0066
10.9658	10.8988	10.8344	10.7723	10.7124	10.6546	10.5987	10.5446	10.4922	10.4414
11.4240	11.3542	11.2871	11.2225	11.1601	11.0998	11.0416	10.9852	10.9307	10.8778
11.8836	11.8111	11.7413	11.6740	11.6091	11.5464	11.4859	11.4272	11.3705	11.3154
12.3447	12.2693	12.1968	12.1269	12.0595	11.9944	11.9315	11.8706	11.8116	11.7545
12.8071	12.7289	12.6537	12.5812	12.5112	12.4437	12.3784	12.3152	12.2540	12.1948
13.2708	13.1898	13.1118	13.0367	12.9642	12.8942	12.8266	12.7611	12.6977	12.6363
13.7358	13.6520	13.5713	13.4935	13.4185	13.3460	13.2760	13.2083	13.1426	13.0790
14.2020	14.1153	14.0319	13.9515	13.8739	13.7990	13.7266	13.6566	13.5887	13.5230
14.6694	14.5799	14.4937	14.4106	14.3305	14.2532	14.1784	14.1060	14.0360	13.9680
15.1380	15.0456	14.9567	14.8710	14.7883	14.7085	14.6313	14.5566	14.4843	14.4142
15.6077	15.5124	15.4207	15.3324	15.2472	15.1648	15.0853	15.0083	14.9337	14.8615
16.0785	15.9804	15.8859	15.7949	15.7071	15.6223	15.5403	15.4610	15.3842	15.3098
16.5504	16.4494	16.3522	16.2585	16.1681	16.0808	15.9964	15.9148	15.8357	15.7591
	16.9195	16.8195	16.7231	16.6301	16.5403	16.4536	16.3696	16.2883	16.2094
			17.1887	17.0932	17.0009	16.9117	16.8254	16.7418	16.6608

Table 5-iii. (つづき)

H \ D	80	82	84
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21	8.2432	8.2053	8.1684
22	8.6698	8.6300	8.5912
23	9.0981	9.0563	9.0156
24	9.5280	9.4841	9.4416
25	9.9594	9.9135	9.8690
26	10.3922	10.3444	10.2979
27	10.8265	10.7766	10.7283
28	11.2621	11.2103	11.1599
29	11.6990	11.6452	11.5929
30	12.1372	12.0814	12.0272
31	12.5767	12.5188	12.4626
32	13.0174	12.9575	12.8993
33	13.4592	13.3973	13.3371
34	13.9021	13.8382	13.7761
35	14.3462	14.2802	14.2161
36	14.7914	14.7233	14.6572
37	15.2376	15.1675	15.0994
38	15.6848	15.6126	15.5425
39	16.1330	16.0588	15.9867
40	16.5822	16.5059	16.4318

注) イタリックはデータの範囲

Table 6-i. 東京アカマツ fg 表

$\log fg = -4.197394 + 1.825037 \log D$

D	FG	D	FG
2	0.0002	52	*0.0860*
4	0.0008	54	*0.0921*
6	*0.0017*	56	*0.0984*
8	*0.0028*	58	*0.1049*
10	*0.0042*	60	*0.1116*
12	*0.0059*	62	*0.1185*
14	*0.0078*	64	*0.1256*
16	*0.0100*	66	*0.1328*
18	*0.0124*	68	*0.1403*
20	*0.0150*	70	*0.1479*
22	*0.0179*	72	*0.1557*
24	*0.0210*	74	*0.1637*
26	*0.0243*	76	*0.1719*
28	*0.0278*	78	*0.1802*
30	*0.0315*	80	*0.1887*
32	*0.0355*	82	*0.1974*
34	*0.0396*	84	*0.2063*
36	*0.0440*	86	*0.2154*
38	*0.0485*	88	0.2246
40	*0.0533*	90	0.2340
42	*0.0582*	92	0.2436
44	*0.0634*	94	0.2533
46	*0.0687*	96	0.2632
48	*0.0743*	98	0.2733
50	*0.0800*	100	0.2836

注) イタリックはデータの範囲

Table 6-ii. 東京アカマツ fh 表

$\log fh = -0.024547 + 0.740833 \log H$

H	FH	H	FH
2	1.5793	21	*9.0156*
3	2.1327	22	*9.3318*
4	2.6392	23	*9.6442*
5	3.1137	24	*9.9531*
6	*3.5640*	25	*10.2587*
7	*3.9951*	26	*10.5612*
8	*4.4105*	27	*10.8606*
9	*4.8127*	28	*11.1572*
10	*5.2034*	29	*11.4511*
11	*5.5841*	30	*11.7423*
12	*5.9559*	31	*12.0310*
13	*6.3197*	32	*12.3174*
14	*6.6764*	33	12.6014
15	*7.0265*	34	12.8832
16	*7.3706*	35	13.1628
17	*7.7092*	36	13.4404
18	*8.0427*	37	13.7160
19	*8.3714*	38	13.9897
20	*8.6956*	39	14.2615
		40	14.5316

注) イタリックはデータの範囲

Table 6-iii. 東京アカマツ *fh* 表

$\log fh = -0.072680 + 0.966639 \log H - 0.160267 \log D$

H \ D	2	4	6	8	10	12	14	16	18
2	1.4793	1.3238	1.2405	1.1846	1.1430	1.1101	1.0830	1.0601	1.0402
3	2.1892	1.9590	1.8357	1.7530	1.6914	1.6427	1.6027	1.5687	1.5394
4	2.8910	2.5871	2.4243	2.3150	2.2337	2.1694	2.1165	2.0716	2.0329
5	3.5870	3.2098	3.0079	2.8723	2.7714	2.6916	2.6259	2.5703	2.5223
6	4.2783	3.8284	3.5876	*3.4259*	3.3056	3.2104	3.1320	3.0657	3.0084
7	4.9657	4.4436	*4.1640*	*3.9764*	3.8367	3.7262	3.6353	3.5583	3.4918
8	5.6499	5.0558	*4.7377*	*4.5243*	*4.3653*	*4.2396*	4.1361	4.0486	3.9729
9	6.3312	5.6655	*5.3090*	*5.0698*	*4.8917*	*4.7509*	*4.6349*	4.5368	4.4519
10	7.0099	6.2729	*5.8782*	*5.6134*	*5.4162*	*5.2602*	*5.1318*	*5.0232*	*4.9292*
11	7.6865	6.8783	*6.4455*	*6.1551*	*5.9389*	*5.7679*	*5.6271*	*5.5080*	*5.4050*
12	8.3609	7.4818	*7.0111*	*6.6952*	*6.4600*	*6.2740*	*6.1209*	*5.9913*	*5.8792*
13	9.0335	8.0837	7.5751	*7.2338*	*6.9797*	*6.7787*	*6.6132*	*6.4732*	*6.3522*
14	9.7044	8.6840	8.1377	*7.7710*	7.4980	*7.2821*	*7.1044*	*6.9540*	*6.8239*
15	10.3736	9.2829	8.6989	*8.3069*	8.0151	*7.7843*	*7.5943*	*7.4335*	*7.2945*
16	11.0414	9.8805	9.2589	8.8417	8.5311	*8.2854*	*8.0832*	*7.9120*	*7.7641*
17	11.7078	10.4768	9.8177	9.3753	9.0459	8.7854	*8.5710*	*8.3896*	*8.2327*
18	12.3729	11.0720	10.3754	9.9079	9.5598	9.2845	9.0579	*8.8661*	*8.7004*
19	13.0367	11.6660	10.9320	10.4395	10.0727	9.7826	9.5439	9.3418	*9.1672*
20	13.6994	12.2590	11.4877	10.9701	10.5847	10.2799	10.0291	9.8167	*9.6331*
21	14.3610	12.8510	12.0425	11.4999	11.0959	10.7764	10.5134	10.2908	*10.0983*
22	15.0215	13.4421	12.5964	12.0288	11.6062	11.2720	10.9969	10.7641	*10.5628*
23	15.6810	14.0323	13.1494	12.5569	12.1158	11.7669	11.4798	11.2367	11.0266
24						12.2611	11.9619	11.7086	11.4897
25						12.7546	12.4433	12.1799	11.9521
26									12.4139
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

注）イタリックはデータの範囲

Table 6-iii. (つづき)

H \ D	20	22	24	26	28	30	32	34	36
2	1.0228								
3	1.5136								
4	1.9989								
5	2.4800	2.4425	2.4086	2.3779	2.3499	2.3240			
6	2.9580	2.9132	2.8728	2.8362	2.8027	2.7719	2.7434	2.7169	2.6921
7	3.4333	3.3813	3.3344	3.2919	3.2531	3.2173	3.1842	3.1534	3.1247
8	3.9063	3.8471	3.7939	3.7455	3.7013	3.6606	3.6229	3.5879	3.5552
9	4.3774	4.3110	4.2513	4.1972	4.1476	4.1020	4.0598	4.0205	3.9839
10	4.8467	4.7732	*4.7071*	*4.6471*	*4.5923*	4.5418	*4.4950*	4.4516	4.4110
11	*5.3145*	5.2339	*5.1614*	*5.0956*	*5.0355*	4.9801	*4.9288*	4.8812	4.8367
12	*5.7808*	*5.6932*	*5.6143*	*5.5428*	*5.4773*	5.4171	*5.3613*	*5.3095*	5.2611
13	*6.2458*	*6.1511*	*6.0660*	*5.9886*	*5.9179*	5.8529	*5.7926*	*5.7366*	5.6843
14	*6.7097*	*6.6079*	*6.5164*	*6.4334*	*6.3574*	*6.2875*	*6.2228*	*6.1626*	6.1064
15	*7.1724*	*7.0637*	*6.9658*	*6.8771*	*6.7959*	*6.7211*	*6.6520*	*6.5876*	6.5276
16	*7.6341*	*7.5184*	*7.4143*	*7.3197*	*7.2333*	*7.1538*	*7.0802*	*7.0117*	*6.9478*
17	*8.0948*	*7.9721*	*7.8617*	*7.7615*	*7.6699*	*7.5855*	*7.5075*	*7.4349*	*7.3671*
18	*8.5547*	*8.4250*	*8.3083*	*8.2024*	*8.1056*	*8.0164*	*7.9340*	*7.8572*	*7.7856*
19	*9.0137*	*8.8770*	*8.7541*	*8.6425*	*8.5405*	*8.4466*	*8.3596*	*8.2788*	*8.2033*
20	*9.4718*	*9.3283*	*9.1991*	*9.0818*	*8.9746*	*8.8759*	*8.7846*	*8.6996*	*8.6203*
21	9.9293	*9.7787*	*9.6433*	*9.5204*	*9.4080*	*9.3045*	*9.2088*	*9.1198*	*9.0366*
22	10.3859	*10.2285*	*10.0869*	*9.9583*	*9.8407*	*9.7325*	*9.6324*	*9.5392*	*9.4522*
23	10.8419	*10.6776*	*10.5297*	*10.3955*	10.2728	*10.1598*	*10.0553*	*9.9580*	*9.8672*
24	11.2973	11.1260	10.9720	10.8321	10.7042	10.5865	*10.4776*	*10.3763*	*10.2816*
25	11.7520	11.5738	11.4136	11.2681	11.1350	11.0126	*10.8993*	10.7939	*10.6955*
26	12.2061	12.0211	11.8546	11.7035	11.5653	11.4381	11.3204	11.2110	11.1087
27	12.6596	12.4677	12.2950	12.1383	11.9950	11.8631	11.7410	11.6275	11.5215
28	13.1126	12.9138	12.7350	12.5726	12.4242	12.2876	12.1611	12.0435	11.9337
29		13.3593	13.1743	13.0064	12.8528	12.7115	12.5807	12.4591	12.3455
30				13.4397	13.2810	13.1350	12.9998	12.8741	12.7567
31				13.8725	13.7087	13.5580	13.4185	13.2887	13.1675
32									13.5779
33									
34									
35									
36									
37									
38									
39									
40									

注) イタリックはデータの範囲

38	40	42	44	46	48	50	52	54	56	58
2.6689	2.6470	2.6264	2.6069							
3.0977	3.0723	3.0484	3.0258	3.0043	2.9839	2.9644				
3.5245	3.4956	3.4684	3.4426	3.4182	3.3950	3.3728	3.3517			
3.9495	3.9172	3.8866	3.8578	3.8304	3.8044	3.7795	3.7559	3.7332	3.7115	
4.3729	4.3371	4.3033	4.2714	4.2411	4.2122	4.1848	4.1585	4.1335	4.1094	4.0864
4.7649	4.7557	4.7167	4.6836	4.6504	4.6167	4.5886	4.5599	4.5324	4.5060	4.4808
5.2157	5.1730	5.1327	5.0946	5.0584	5.0240	4.9913	4.9600	4.9301	4.0914	4.8739
5.6353	5.5891	5.5456	5.5044	5.4653	5.4282	5.3928	5.3590	5.3267	5.2957	5.2660
6.0538	6.0042	5.9574	*5.9132*	5.8712	5.8313	5.7933	5.7570	5.7223	5.6890	5.6571
6.4713	*6.4183*	6.3683	*6.3210*	6.2761	6.2335	6.1928	*6.1540*	6.1169	6.0813	6.0472
6.8878	*6.8314*	*6.7782*	*6.7279*	*6.6801*	6.6347	6.5914	*6.5501*	6.5106	*6.4728*	6.4365
7.3035	*7.2437*	*7.1873*	*7.1339*	*7.0833*	*7.0351*	6.9893	*6.9455*	6.9036	*6.8635*	6.8250
7.7184	*7.6552*	*7.5956*	*7.5392*	*7.4857*	*7.4348*	*7.3863*	*7.3400*	*7.2958*	*7.2534*	7.2127
8.1325	*8.0660*	*8.0031*	*7.9437*	*7.8873*	*7.8337*	*7.7826*	*7.7338*	*7.6872*	*7.6425*	*7.5997*
8.5459	*8.4760*	*8.4099*	*8.3475*	*8.2882*	*8.2319*	*8.1782*	*8.1270*	*8.0779*	*8.0310*	*7.9860*
8.9586	*8.8853*	*8.8161*	*8.7506*	*8.6885*	*8.6294*	*8.5731*	*8.5194*	*8.4681*	*8.4188*	*8.3716*
9.3707	*9.2940*	*9.2216*	*9.1531*	*9.0881*	*9.0263*	*8.9675*	*8.9113*	*8.8575*	*8.8061*	*8.7567*
9.7821	*9.7020*	*9.6265*	*9.5549*	*9.4871*	*9.4226*	*9.3612*	*9.3025*	*9.2464*	*9.1927*	9.1411
10.1929	*10.1095*	*10.0307*	*9.9562*	*9.8856*	*9.8184*	*9.7543*	9.6932	*9.6348*	*9.5788*	9.5250
10.6032	10.5164	10.4345	*10.3570*	10.2834	*10.2135*	*10.1469*	10.0833	*10.0225*	*9.9643*	9.9084
11.0129	10.9227	10.8377	10.7572	10.6808	*10.6082*	*10.5390*	10.4730	*10.4098*	*10.3493*	10.2913
11.4221	11.3286	11.2403	11.1568	11.0776	11.0023	10.9306	10.8621	10.7966	10.7338	10.6736
11.8308	11.7339	11.6425	11.5560	11.4740	11.3960	11.3217	11.2507	11.1829	11.1179	11.0555
12.2389	12.1387	12.0442	11.9547	11.8699	11.7892	11.7123	11.6389	11.5687	11.5015	11.4370
12.6467	12.5431	12.4454	12.3530	12.2653	12.1819	12.1025	12.0266	11.9541	11.8846	11.8180
13.0539	12.9471	12.8462	12.7508	12.6603	12.5742	12.4922	12.4139	12.3391	12.2674	12.1986
13.4608	13.3506	13.2466	13.1482	13.0548	12.9661	12.8815	12.8008	12.7236	12.6497	12.5788
			13.5451	13.4490	13.3576	13.2705	13.1873	13.1078	13.0316	12.9585
						13.6590	13.5734	13.4916	13.4131	13.3379

Table 6-iii. (つづき)

H \ D	60	62	64	66	68	70	72	74	76	78
2										
3										
4										
5										
6										
7										
8										
9										
10	4.0643									
11	4.4565	4.4331	4.4106							
12	4.8475	4.8221	4.7976	4.7740	4.7513					
13	5.2375	5.2100	5.1836	5.1581	5.1335	5.1097	5.0867	5.0644	5.0428	5.0218
14	5.6264	5.5969	5.5685	5.5411	5.5147	5.4891	5.4644	5.4405	5.4173	5.3948
15	6.0145	5.9829	5.9526	5.9233	5.8950	5.8677	5.8413	5.8157	5.7909	5.7668
16	6.4016	6.3681	6.3358	6.3046	6.2745	6.2454	6.2173	6.1900	6.1636	6.1380
17	6.7880	6.7524	6.7181	6.6851	6.6532	6.6223	6.5925	6.5636	6.5356	6.5085
18	7.1736	7.1360	7.0998	7.0648	7.0311	6.9985	6.9670	6.9365	6.9069	6.8782
19	7.5585	7.5189	7.4807	7.4439	7.4084	7.3740	7.3408	7.3087	7.2775	7.2472
20	*7.9427*	*7.9011*	7.8610	7.8223	7.7850	7.7489	7.7140	7.6802	7.6474	7.6156
21	*8.3263*	*8.2826*	8.2406	8.2000	8.1609	8.1231	8.0865	8.0511	8.0167	7.9834
22	*8.7092*	*8.6636*	8.6196	5.5772	8.5363	8.4967	8.4584	8.4214	8.3854	8.3506
23	*9.0916*	*9.0440*	*8.9981*	8.9538	8.9110	8.8697	8.8298	8.7911	8.7536	8.7172
24	*9.4734*	*9.4238*	*9.3759*	9.3298	9.2853	9.2423	9.2006	9.1603	9.1212	9.0833
25	*9.8547*	*9.8031*	*9.7533*	9.7053	9.6590	9.6142	9.5709	9.5290	9.4884	9.4489
26	*10.2355*	*10.1819*	*10.1302*	10.0804	10.0322	9.9857	9.9408	9.8972	9.8550	9.8141
27	10.6158	*10.5602*	*10.5066*	10.4549	10.4050	10.3568	10.3101	10.2649	10.2212	10.1787
28	10.9956	*10.9380*	*10.8825*	*10.8290*	*10.7773*	10.7273	*10.6790*	10.6322	10.5869	10.5429
29	11.3750	11.3154	*11.2580*	11.2026	11.1491	11.0974	11.0474	10.9990	10.9521	10.9066
30	11.7540	11.6924	*11.6330*	11.5758	11.5205	11.4671	11.4155	*11.3655*	11.3170	11.2700
31	12.1325	12.0689	*12.0076*	11.9486	11.8915	11.8364	11.7831	11.7315	11.6814	11.6329
32	12.5106	12.4450	*12.3819*	12.3209	12.2621	12.2053	12.1503	12.0971	12.0455	11.9954
33	12.8883	12.8208	12.7557	12.6929	12.6324	12.5738	12.5172	12.4623	12.4092	12.3576
34	13.2656	13.1961	13.1291	13.0646	13.0022	12.9419	12.8836	12.8272	12.7725	12.7194
35	13.6426	13.5711	13.5022	13.4358	13.3717	13.3097	13.2497	13.1917	13.1354	13.0809
36			13.8750	13.8067	13.7408	13.6771	13.6155	13.5558	13.4980	13.4420
37				14.1773	14.1096	14.0442	13.9809	13.9197	13.8603	13.8027
38						14.4109	14.3460	14.2832	14.2222	14.1632
39								14.6463	14.5839	14.5233
40										

80	82	84	86	88
5.3729	5.3517	5.3311	5.3110	
5.7435	5.7208	5.6987	5.6773	
6.1132	6.0890	6.0656	6.0427	
6.4821	6.4565	6.4316	6.4074	
6.8504	6.8233	6.7970	7.7714	
7.2179	7.1894	7.1617	6.1347	
7.5848	7.5548	7.5257	7.4974	
7.9511	7.9197	7.8892	7.8595	
8.3168	8.2839	8.2520	8.2210	
8.6819	8.6477	8.6143	8.5819	
9.0466	9.0108	8.9761	8.9423	
9.4107	9.3735	9.3374	9.3022	
9.7743	9.7357	9.6982	9.6617	
10.1375	10.0974	10.0585	10.0207	
10.5002	10.4587	10.4184	10.3792	
10.8625	10.8196	10.7779	10.7373	
11.2243	11.1800	11.1369	*11.0950*	
11.5858	11.5400	11.4956	11.4523	
11.9469	11.8997	11.8538	11.8092	
12.3076	12.2590	12.2117	12.1657	
12.6679	12.6179	12.5692	12.5219	
13.0279	12.9764	12.9264	12.8778	
13.3875	13.3347	13.2833	13.2333	
13.7468	13.6925	13.6398	13.5884	
14.1058	14.0501	13.9959	13.9433	
14.4645	14.4073	14.3518	14.2978	
14.8228	14.7643	14.7074	14.6520	

Table 7-i. 東京広葉樹 *fg* 表

$\log fg = -4.332924 + 1.910152 \log D$

D	*FG*	*D*	*FG*
2	0.0002	58	0.1085
4	0.0007	60	0.1158
6	0.0014	62	0.1233
8	0.0025	64	0.1310
10	0.0038	66	0.1389
12	0.0054	68	0.1470
14	0.0072	70	0.1554
16	0.0093	82	0.1640
18	0.0116	84	0.1726
20	0.0142	86	0.1819
22	0.0170	88	0.1911
24	0.0201	80	0.2006
26	0.0234	82	0.2103
28	0.0270	84	0.2202
30	0.0308	86	0.2303
32	0.0349	88	0.2406
34	0.0391	90	0.2512
36	0.0436	92	0.2619
38	0.0484	94	0.2729
40	0.0534	96	0.2841
42	0.0586	98	0.2955
44	0.0640	100	0.3072
46	0.0697	102	0.3190
48	0.0756	104	0.3311
50	0.0817	106	0.3433
52	0.0881	108	0.3558
54	0.0947	110	0.3685
56	0.1015		

Table 7-ii. 東京広葉樹 *fh* 表

$\log fh = -0.224224 + 0.890720 \log H$

H	*FH*	*H*	*FH*
3	1.5877	21	8.9847
4	2.0514	22	9.3648
5	2.5024	23	9.7430
6	2.9437	24	10.1195
7	3.3769	25	10.4942
8	3.8034	26	10.8673
9	4.2242	27	11.2388
10	4.6398	28	11.6088
11	5.0509	29	11.9774
12	5.4579	30	12.3446
13	5.8612	31	12.7105
14	6.2612	32	13.0750
15	6.6580	33	13.4384
16	7.0520	34	13.8005
17	7.4432	35	14.1615
18	7.8320	36	14.5213
19	8.2184	37	14.8801
20	8.6026	38	15.2378
		39	15.5944
		40	15.9501

Table 7-iii.

$\log fh = -0.278659$

H \ D	4	6	8	10	12	14	16	18	20
3	1.4507								
4	1.9792	1.8818	1.8156	1.7659					
5	2.5185	2.3945	2.3103	2.2470	2.1966	2.1549	2.1193		
6	3.0665	2.9155	2.8130	2.7359	2.6745	2.6237	2.5805	2.5429	2.5098
7	3.6218	3.4435	3.3224	3.2314	3.1589	3.0989	3.0478	3.0034	2.9643
8	4.1835	3.9776	3.8377	3.7326	3.6488	3.5795	3.5205	3.4696	3.4241
9	4.7509	4.5171	4.3582	4.2388	4.1437	4.0650	3.9979	3.9398	3.8884
10	5.3233	5.0614	4.8833	4.7495	4.6430	4.5547	4.4797	4.4145	4.3570
11		5.6100	5.4127	5.2644	5.1463	5.0485	4.9652	4.8930	4.8292
12		6.1626	5.9458	5.7830	5.6532	5.5458	5.4544	5.3750	5.3049
13			6.4826	6.3050	6.1635	6.0464	5.9467	5.8602	5.7838
14			7.0227	6.8303	6.6770	6.5501	6.4422	6.3484	6.2657
15				7.3586	7.1934	7.0567	6.9404	6.8394	6.7503
16				7.8896	7.7126	7.5660	7.4413	7.3330	7.2375
17					8.2344	8.0779	7.9447	7.8291	7.7271
18					8.7586	8.5922	8.4505	8.3275	8.2190
19						9.1087	8.9586	8.8282	8.7132
20						9.6274	9.4687	9.3309	9.2094
21							9.9810	9.8357	9.7075
22							10.4951	10.3424	10.2076
23								10.8509	10.7095
24								11.3612	11.2132
25									11.7185
26									12.2254
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

東京広葉樹 *fh* 表

$+1.079783 \log H - 0.124472 \log D$

22	24	26	28	30	32	34	36	38	40
3.3837	3.3472	3.3140	3.2836	3.2555					
3.8426	3.8012	3.7635	3.7289	3.6971					
4.3056	4.2592	4.2170	4.1782	4.1425					
4.7723	4.7209	4.6741	4.6312	4.5916	4.5548	4.5206	4.4885	4.4584	4.4300
5.2424	5.1859	5.1345	5.0874	5.0439	5.0035	4.9659	4.9307	4.8976	4.8664
5.7156	5.6541	5.5980	5.5466	5.4992	5.4552	5.4142	5.3758	5.3397	5.3058
6.1918	6.1231	6.0644	6.0087	5.9573	5.9097	5.8652	5.8236	5.7846	5.7478
6.6707	6.5983	6.5334	6.4734	6.4181	6.3667	6.3189	6.2741	6.2320	6.1923
7.1521	7.0751	7.0049	6.9406	6.8813	6.8262	6.7749	6.7269	6.6818	6.6392
7.6360	7.5537	7.4788	7.4102	7.3468	7.2880	7.2332	7.1820	7.1338	7.0884
8.1221	8.0346	7.9550	7.8819	7.8145	7.7520	7.6937	7.6392	7.5879	7.5397
8.6104	8.5177	8.4332	8.3558	8.2843	8.2180	8.1563	8.0984	8.0441	7.9929
9.1008	9.0027	8.9135	8.8316	8.7561	8.6860	8.6208	8.5596	8.5022	8.4481
9.5931	9.4897	9.3956	9.3094	9.2298	9.1559	9.0871	9.0227	8.9622	8.9051
10.0872	9.9786	9.8797	9.7869	9.7052	9.6276	9.5552	9.4875	9.4238	9.3639
10.5832	10.4692	10.3654	10.2703	10.1824	10.1010	10.0250	9.9540	9.8872	9.8243
11.0809	10.9616	10.8529	10.7532	10.6613	10.5760	10.4965	10.4221	10.3522	10.2863
11.5803	11.4555	11.3420	11.2378	11.1417	11.0526	10.9695	10.8917	10.8187	10.7498
12.0812	11.9511	11.8326	11.7240	11.6237	11.5307	11.4440	11.3629	11.2867	11.2149
12.5837	12.4482	12.3248	12.2116	12.1072	12.0103	11.9200	11.8355	11.7561	11.6813
13.0877	12.9467	12.8184	12.7007	12.5921	12.4913	12.3974	12.3095	12.2270	12.1492
	13.4467	13.3134	13.1912	13.0784	12.9737	12.8762	12.7849	12.6992	12.6183
	13.9481	13.8098	13.6830	13.5660	13.4574	13.3563	13.2616	13.1726	13.0888
				14.0549	13.9425	13.8376	13.7395	13.6474	13.5605
				14.5451	14.4287	14.3202	14.2187	14.1233	14.0335

Table 7-iii.

$\log fh = -0.278659$

H \ D	42	44	46	48	50	52	54	56	58
3									
4									
5									
6									
7									
8									
9									
10									
11	4.4032	4.3778	4.3536						
12	4.8370	4.8090	4.7825						
13	5.2736	5.2432	5.2142	5.1867	5.1604	5.1353	5.1112		
14	5.7130	5.6800	5.6486	5.6188	5.5903	5.5631	5.5370	5.5120	
15	6.1548	6.1193	6.0855	6.0534	6.0227	5.9934	5.9653	5.9383	5.9124
16	6.5990	6.5609	6.5247	6.4903	6.4574	6.4259	6.3958	6.3669	6.3392
17	7.0455	7.0048	6.9661	6.9293	6.8942	6.8606	6.8285	6.7976	6.7680
18	7.4940	7.4507	7.4096	7.3705	7.3331	7.2974	7.2632	7.2304	7.1989
19	7.9445	7.8987	7.8551	7.8136	7.7740	7.7361	7.6999	7.6651	7.6317
20	8.3970	8.3485	8.3024	8.2586	8.2167	8.1767	8.1384	8.1016	8.0663
21	8.8512	8.8001	8.7515	8.7053	8.6612	8.6190	8.5786	8.5399	8.5026
22	9.3072	9.2534	9.2024	9.1537	9.1074	9.0630	9.0205	8.9798	8.9406
23	9.7648	9.7084	9.6548	9.6036	9.5552	9.5086	9.4641	9.4213	9.3802
24	10.2240	10.1650	10.1089	10.0555	10.0045	9.9558	9.9091	9.8644	9.8214
25	10.6847	10.6230	10.5644	10.5086	10.4554	10.4044	10.3557	10.3089	10.2640
26	11.1470	11.0826	11.0214	10.9632	10.9076	10.8545	10.8037	10.7549	10.7080
27	11.6106	11.5436	11.4799	11.4192	11.3613	11.3060	11.2530	11.2022	11.1534
28	12.0756	12.0059	11.9396	11.8766	11.8164	11.7588	11.7037	11.6508	11.6001
29	12.5419	12.4695	12.4007	12.3352	12.2727	12.2129	12.1557	12.1008	12.0480
30	13.0096	12.9344	12.8631	12.7951	12.7303	12.6683	12.6089	12.5519	12.4972
31	13.4784	13.4006	13.3267	13.2563	13.1891	13.1246	13.0633	13.0043	12.9476
32	13.9485	13.8680	13.7914	13.7186	13.6490	13.5826	13.5189	13.4579	13.3992
33	14.4197	14.3365	14.2574	14.1821	14.1102	14.0415	13.9757	13.9125	13.8519
34	14.8921	14.8062	14.7245	14.6467	14.5724	14.5015	14.4335	14.3683	14.3057
35	15.3656	15.2769	15.1926	15.1124	15.0358	14.9625	14.8924	14.8252	14.7605
36	15.8402	15.7488	15.6619	15.5791	15.5002	15.4247	15.3524	15.2830	15.2164
37	16.3158	16.2216	16.1321	16.0469	15.9656	15.8878	15.8134	15.7419	15.6733
38	16.7925	16.6956	16.6034	16.5157	16.4320	16.3520	16.2753	16.2018	16.1312
39	17.2702	17.1705	17.0757	16.9855	16.8994	16.8171	16.7383	16.6627	16.5901
40	17.7488	17.6463	17.5490	17.4562	17.3678	17.2832	17.2022	17.1245	17.0499

東京広葉樹 *fh* 表

$+1.079783 \log H - 0.124472 \log D$

60	62	64	66	68	70	72	74	76	78
5.8876	5.8636	5.8404	5.8181	5.7965	5.7757	5.7554	5.7358	5.7168	5.6984
6.3125	6.2868	6.2620	6.2380	6.2149	6.1925	6.1708	6.1498	6.1294	6.1097
6.7395	6.7121	6.6856	6.6600	6.6353	6.6114	6.5883	6.5659	6.5441	6.5230
7.1686	7.1394	7.1112	7.0840	7.0578	7.0323	7.0077	6.9839	6.9607	6.9383
7.5995	7.5686	7.5387	7.5099	7.4821	7.4551	7.4290	7.4037	7.3792	7.3554
8.0323	7.9996	7.9681	7.9376	7.9082	7.8797	7.8521	7.8254	7.7994	7.7743
8.4668	8.4323	8.3991	8.3670	8.3360	8.3059	8.2769	8.2487	8.2213	8.1948
8.9030	8.8667	8.8318	8.7980	8.7654	8.7338	8.7032	8.6736	8.6449	86.170
9.3408	9.3027	9.2660	9.2306	9.1964	9.1632	9.1312	9.1001	9.0699	9.0406
9.7800	9.7402	9.7018	9.6647	9.6288	9.5942	9.5606	9.5280	9.4964	9.4658
10.2208	10.1791	10.1390	10.1002	10.0628	10.0265	9.9914	9.9574	9.9244	9.8924
10.6629	10.6195	10.5776	10.5371	10.4981	10.4603	10.4236	10.3882	10.3537	10.3203
11.1064	11.0612	11.0175	10.9754	10.9347	10.8953	10.8572	10.8202	10.7844	10.7496
11.5512	11.5042	11.4586	11.4150	11.3727	11.3317	11.2920	11.2536	11.2163	11.1801
11.9973	11.9484	11.9013	11.8558	11.8118	11.7693	11.7281	11.6882	11.6494	11.6118
12.4446	12.3939	12.3450	12.2979	12.2522	12.2081	12.1654	12.1240	12.0838	12.0448
12.8931	12.8406	12.7900	12.7411	12.6938	12.6481	12.6038	12.5609	12.5193	12.4789
13.3428	13.2884	13.2360	13.1854	13.1365	13.0892	13.0434	12.9990	12.9559	12.9141
13.7936	13.7374	13.6832	13.6309	13.5803	13.5314	13.4841	13.4382	13.3936	13.3504
14.2454	14.1874	14.1315	14.0774	14.0252	13.9747	13.9258	13.8784	13.8324	13.7877
14.6984	14.6385	14.5808	14.5250	14.4712	14.4190	14.3686	14.3197	14.2722	14.2261
15.1524	15.0906	15.0311	14.9737	14.9181	14.8644	14.8124	14.7619	14.7130	14.6655
15.6073	15.5438	15.4825	15.4233	15.3661	15.3107	15.2571	15.2052	15.1548	15.1059
16.0633	15.9979	15.9348	15.8739	15.8150	15.7580	15.7029	15.6494	15.5975	15.5472
16.5202	16.4529	16.3880	16.3254	16.2648	16.2063	16.1495	16.0945	16.0412	15.9894
16.9781	16.9089	16.8422	16.7778	16.7156	16.6554	16.5971	16.5406	16.4858	16.4326

Table 7-iii.

$\log fh = -0.278659$

H \ D	80	82	84	86	88	90	92	94	96
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15	5.6805	5.6630	5.6461	5.6296	5.6135	5.5978	5.5825	5.5676	5.5530
16	6.0904	6.0717	6.0536	6.0359	6.0186	6.0018	5.9854	5.9694	5.9538
17	6.5025	6.4825	6.4631	6.4442	6.4258	6.4078	6.3903	6.3732	6.3566
18	6.9164	6.8952	6.8746	6.8544	6.8349	6.8158	6.7971	6.7790	6.7612
19	7.3322	7.3097	7.2878	7.2665	7.2458	7.2255	7.2058	7.1865	7.1677
20	7.7498	7.7260	7.7029	7.6803	7.6584	7.6370	7.6161	7.5958	7.5759
21	8.1690	8.1439	8.1196	8.0958	8.0727	8.0501	8.0281	8.0067	7.9857
22	8.5898	8.5635	8.5378	8.5129	8.4885	8.4648	8.4417	8.4191	8.3971
23	9.0122	8.9845	8.9576	8.9314	8.9059	8.8810	8.8568	8.8331	8.8100
24	9.4360	9.4071	9.3789	9.3515	9.3247	9.2987	9.2733	9.2485	9.2243
25	9.8612	9.8310	9.8015	9.7729	9.7449	9.7177	9.6912	9.6653	9.6400
26	10.2878	10.2563	10.2255	10.1956	10.1665	10.1381	10.1104	10.0834	10.0570
27	10.7157	10.6829	10.6509	10.6197	10.5894	10.5598	10.5309	10.5028	10.4753
28	11.1449	11.1107	11.0774	11.0450	11.0135	10.9827	10.9527	10.9234	10.8948
29	11.5753	11.5398	11.5052	11.4716	11.4388	11.4068	11.3757	11.3453	11.3156
30	12.0069	11.9700	11.9342	11.8993	11.8653	11.8321	11.7998	11.7683	11.7375
31	12.4396	12.4014	12.3643	12.3281	12.2929	12.2586	12.2251	12.1924	12.1605
32	12.8735	12.8339	12.7955	12.7581	12.7216	12.6861	12.6514	12.6176	12.5846
33	13.3084	13.2675	13.2278	13.1891	13.1514	13.1147	13.0789	13.0439	13.0098
34	13.7444	13.7022	13.6611	13.6212	13.5823	13.5443	13.5073	13.4712	13.4360
35	14.1814	14.1378	14.0955	14.0543	14.0141	13.9750	13.9368	13.8995	13.8632
36	14.6194	14.5745	14.5309	14.4884	14.4470	14.4066	14.3672	14.3288	14.2913
37	15.0583	15.0121	14.9672	14.9234	14.8808	14.8392	14.7987	14.7591	14.7205
38	15.4983	15.4507	15.4044	15.3594	15.3155	15.2727	15.2310	15.1903	15.1505
39	15.9391	15.8902	15.8426	15.7963	15.7511	15.7071	15.6642	15.6224	15.5815
40	16.3809	16.3306	16.2817	16.2341	16.1877	16.1425	16.0984	16.0553	16.0133

東京広葉樹 *fh* 表

$+1.079783 \log H - 0.124472 \log D$

98	100	102	104	106	108	110	112	114	116
5.5388	5.5249	5.5113	5.4979	5.4849	5.4722	5.4597			
5.9385	5.9236	5.9090	5.8948	5.8808	5.8671	5.8537			
6.3403	6.3243	6.3088	6.2935	6.2786	6.2640	6.2498			
6.7439	6.7270	6.7104	6.6942	6.6784	6.6628	6.6476			
7.1493	7.1314	7.1138	7.0967	7.0798	7.0634	7.0473			
7.5565	7.5375	7.5189	7.5008	7.4830	7.4656	7.4486			
7.9652	7.9452	7.9257	7.9065	7.8878	7.8695	7.8515			
8.3756	8.3545	8.3340	8.3139	8.2942	8.2749	8.2560			
8.7874	8.7653	8.7437	8.7226	8.7020	8.6818	8.6619			
9.2006	9.1775	9.1549	9.1328	9.1112	9.0900	9.0693			
9.6153	9.5911	9.5675	9.5444	9.5218	9.4997	9.4780			
10.0312	10.0060	9.9814	9.9573	9.9337	9.9106	9.8880			
10.4484	10.4222	10.3965	10.3714	10.3469	10.3228	10.2993			
10.8669	10.8396	10.8129	10.7868	10.7613	10.7363	10·7118			
11.2866	11.2582	11.2305	11.2034	11.1769	11.1509	11.1254			
11.7074	11.6780	11.6492	11.6211	11.5936	11.5666	11.5403			
12.1293	12.0989	12.0691	12.0399	12.0114	11.9835	11.9562			
12.5523	12.5208	12.4900	12.4598	12.4303	12.4014	12.3732			
12.9764	12.9438	12.9120	12.8808	12.8503	12.8204	12.7912			
13.4015	13.3679	13.3350	13.3026	13.2713	13.2404	13.2102			
13.8276	13.7929	13.7589	13.7257	13.6932	13.6614	13.6302			
14.2547	14.2189	14.1839	14.1497	14.1162	14.0833	14.0512			
14.6827	14.6459	14.6098	14.5745	14.5400	14.5062	14.4731			
15.1117	15.0737	15.0366	15.0003	14.9648	14.9300	14.8960			
15.5415	15.5025	15.4643	15.4270	15.3905	15.3547	15.3197			
15.9723	15.9321	15.8929	15.8546	15.8170	15.7803	15.7443			

Table 8-i.　前橋スギ fg 表

$\log fg = -4.153969 + 1.805782 \log D$

D	FG	D	FG
2	0.0003	52	*0.0881*
4	*0.0009*	54	*0.0943*
6	*0.0018*	56	*0.1007*
8	*0.0030*	58	*0.1073*
10	*0.0045*	60	0.1140
12	*0.0062*	62	0.1210
14	*0.0082*	64	0.1281
16	*0.0105*	66	0.1354
18	*0.0130*	68	0.1429
20	*0.0157*	70	0.1506
22	*0.0186*	72	0.1585
24	*0.0218*	74	0.1665
26	*0.0252*	76	0.1747
28	*0.0288*	78	0.1831
30	*0.0326*	80	0.1917
32	*0.0366*	82	0.2004
34	*0.0409*	84	0.2093
36	*0.0453*	86	0.2184
38	*0.0500*	88	0.2277
40	*0.0548*	90	0.2371
42	*0.0599*	92	0.2467
44	*0.0651*	94	0.2565
46	*0.0706*	96	0.2664
48	*0.0762*	98	0.2765
50	*0.0820*	100	0.2868

注）イタリックはデータの範囲

Table 8-ii.　前橋スギ fh 表

$\log fh = -0.024080 + 0.765349 \log H$

H	FH	H	FH
2	1.6081	21	*9.7248*
3	*2.1932*	22	*10.0773*
4	*2.7334*	23	*10.4260*
5	*3.2425*	24	*10.7712*
6	*3.7280*	25	*11.1130*
7	*4.1948*	26	*11.4517*
8	*4.6462*	27	*11.7873*
9	*5.0845*	28	*12.1200*
10	*5.5115*	29	*12.4499*
11	*5.9286*	30	*12.7771*
12	*6.3368*	31	*13.1018*
13	*6.7371*	32	*13.4241*
14	*7.1303*	33	13.7440
15	*7.5169*	34	14.0616
16	*7.8975*	35	14.3771
17	*8.2726*	36	14.6904
18	*8.6425*	37	15.0017
19	*9.0077*	38	15.3111
20	*9.3683*	39	15.6185
		40	15.9241

注）イタリックはデータの範囲

Table 8-iii.

$\log fh =$

H \ D	4	6	8
2	1.2435	1.1202	1.0402
3	*1.9382*	1.7460	1.6213
4	*2.6556*	2.3923	2.2214
5	*3.3903*	*3.0541*	2.8360
6	4.1392	*3.7288*	*3.4625*
7		*4.4142*	*4.0990*
8		*5.1090*	*4.7441*
9		*5.8120*	*5.3970*
10			*6.0567*
11			*6.7228*
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			

注）イタリックはデータの範囲

前　橋　ス　ギ　*fh*　表

$-0.079840+1.094661 \log H-0.257541 \log D$

10	12	14	16	18	20	22	24	26	28
1.5308	1.4605	1.4037							
2.0974	2.0011	1.9233	1.8582						
2.6777	2.5548	2.4554	2.3724	2.3015					
3.2691	3.1192	2.9978	2.8964	2.8099	2.7347	2.6684	2.6092		
3.8700	3.6925	3.5486	3.4288	3.3264	3.2373	3.1588	3.0888	3.0258	
4.4792	4.2737	*4.1074*	3.9685	3.8499	3.7469	3.6560	3.5750	3.5021	3.4359
5.0956	*4.8618*	*4.6726*	4.5146	4.3797	4.2625	4.1591	4.0670	3.9840	3.9087
5.7185	*5.4562*	*5.2438*	*5.0665*	4.9152	4.7836	4.6676	4.5642	4.4710	4.3865
6.3473	*6.0562*	*5.8205*	*5.6237*	5.4557	5.3096	5.1809	5.0661	4.9627	4.8689
6.9816	*6.6614*	*6.4021*	*6.1857*	6.0009	*5.8402*	5.6986	5.5723	5.4586	5.3554
7.6210	*7.2714*	*6.9884*	*6.7521*	6.5504	*6.3750*	6.2205	*6.0826*	5.9585	5.8459
8.2650	*7.8859*	*7.5789*	*7.3227*	*7.1039*	*6.9137*	*6.7461*	*6.5966*	6.4620	6.3399
	8.5045	*8.1735*	*7.8972*	*7.6612*	*7.4561*	*7.2753*	*7.1141*	6.9690	*6.8372*
	9.1270	*8.7718*	*8.4753*	*8.2220*	*8.0019*	*7.8079*	*7.6349*	7.4791	*7.3377*
	9.7533	9.3737	*9.0568*	*8.7862*	*8.5510*	*8.3436*	*8.1588*	*7.9923*	*7.8412*
	10.3830	9.9789	*9.6416*	*9.3535*	*9.1031*	*8.8824*	*8.6855*	*8.5083*	*8.3475*
			10.2294	*9.9238*	*9.6581*	*9.4240*	*9.2151*	*9.0271*	*8.8564*
			10.8202	*10.4969*	*10.2159*	*9.9682*	*9.7473*	*9.5485*	*9.3679*
				11.0728	*10.7764*	*10.5151*	*10.2821*	*10.0723*	*9.8819*
				11.6513	*11.3394*	*11.0644*	*10.8192*	*10.5985*	*10.3981*
					11.9048	*11.6161*	*11.3587*	*11.1270*	*10.9166*
						12.1701	*11.9004*	*11.6576*	11.4372
							12.4443	*12.1904*	11.9399
							12.9902	*12.7251*	12.4846
							13.5381	13.2619	13.0112

Table 8-iii. (つづき)

H \ D	30	32	34	36	38	40	42	44	46
2									
3									
4									
5									
6									
7									
8									
9	3.8398								
10	4.3093	4.2382							
11	4.7831	4.7043	4.6314						
12	5.2611	5.1744	5.0942	5.0198	4.9504				
13	5.7429	5.6482	5.5607	5.4795	5.4037	5.3328	5.2662		
14	6.2282	*6.1255*	6.0306	5.9425	5.8603	5.7834	5.7112	5.6432	5.5790
15	*6.7168*	*6.6061*	6.5037	6.4087	6.3201	6.2371	6.1593	6.0859	6.0166
16	*7.2085*	*7.0897*	6.9798	6.8778	6.7827	6.6937	6.6101	6.5314	6.4571
17	*7.7031*	*7.5761*	7.4588	7.3498	7.2481	7.1530	7.0637	6.9796	6.9001
18	*8.2005*	*8.0653*	*7.9403*	*7.8243*	7.7161	*7.6149*	7.5198	7.4302	7.3456
19	*8.7005*	*8.5571*	*8.4245*	*8.3014*	*8.1866*	*8.0792*	*7.9783*	7.8833	7.7935
20	*9.2030*	*9.0513*	*8.9110*	*8.7808*	*8.6594*	*8.5458*	*8.4391*	8.3386	8.2436
21	*9.7078*	*9.5478*	*9.3999*	*9.2625*	*9.1345*	*9.0146*	*8.9020*	*8.7960*	8.6959
22	*10.2150*	*10.0466*	*9.8910*	*9.7464*	*9.6117*	*9.4855*	*9.3671*	*9.2555*	9.1502
23	*10.7244*	*10.5476*	*10.3842*	*10.2324*	*10.0909*	*9.9585*	*9.8342*	*9.7170*	*9.6064*
24	*11.2358*	*11.0506*	*10.8794*	*10.7204*	*10.5722*	*10.4334*	*10.3032*	*10.1805*	*10.0646*
25	*11.7493*	*11.5556*	*11.3766*	*11.2103*	*11.0553*	*10.9102*	*10.7740*	*10.6457*	*10.5245*
26	12.2647	*12.0625*	*11.8757*	*11.7021*	*11.5403*	*11.3889*	*11.2466*	*11.1127*	*10.9862*
27	12.7820	12.5713	*12.3766*	*12.1957*	*12.0271*	*11.8692*	*11.7210*	*11.5814*	*11.4496*
28	13.3011	13.0819	*12.8792*	*12.6910*	*12.5155*	*12.3513*	*12.1970*	*12.0518*	*11.9146*
29		13.5942	*13.3836*	13.1880	13.0056	*12.8349*	*12.6747*	*12.5237*	*12.3812*
30			*13.8896*	13.6866	13.4973	13.3202	*13.1539*	*12.9972*	*12.8493*
31			*14.3972*	14.1868	13.9906	13.8070	*13.6346*	13.4722	13.3189
32					14.4854	14.2953	*14.1168*	13.9487	13.7899
33							14.6004	14.4265	14.2623
34									14.7361
35									
36									
37									
38									
39									
40									

48	50	52	54	56	58	60	62	64	66
5.9510	5.8868								
6.3867	6.3199	6.2564	6.1959						
6.8249	6.7535	6.6856	6.6210	6.5593	6.5002				
7.2656	7.1896	7.1173	7.0485	6.9828	6.9200	6.8598	6.8021		
7.7086	7.6279	7.5513	7.4782	7.4085	7.3419	7.2781	7.2168	7.1581	7.1016
8.1538	8.0685	7.9874	7.9101	7.8364	7.7659	7.6984	7.6337	7.5715	7.5117
8.6011	8.5111	8.4256	8.3441	8.2663	8.1919	8.1207	8.0524	7.9869	7.9238
9.0504	8.9558	8.8658	8.7800	8.6982	8.6199	8.5450	8.4731	8.4041	8.3378
9.5017	*9.4023*	9.3078	*9.2178*	9.1319	9.0497	8.9711	8.8956	8.8232	8.7535
9.9549	*9.8507*	9.7517	*9.6574*	9.5674	9.4813	9.3989	9.3199	9.2440	9.1710
10.4098	*10.3009*	10.1974	*10.0988*	10.0046	9.9146	9.8284	9.7458	9.6664	9.5901
10.8665	*10.7528*	10.6447	*10.5418*	10.4435	10.3495	10.2596	10.1733	10.0905	10.0108
11.3248	*11.2063*	11.0937	*10.9864*	10.8840	10.7861	10.6923	10.6024	10.5161	10.4330
11.7847	*11.6615*	*11.5442*	*11.4326*	11.3260	11.2241	11.1266	11.0330	10.9431	10.8568
12.2462	*12.1181*	*11.9963*	11.8803	11.7696	11.6637	11.5623	11.4650	11.3717	11.2819
12.7092	*12.5763*	*12.4499*	12.3295	*12.2145*	*12.1046*	11.9994	11.8985	11.8016	11.7085
13.1737	*13.0359*	*12.9049*	12.7801	12.6609	12.5470	12.4380	12.3334	12.2329	12.1364
13.6396	*13.4969*	*13.3613*	13.2320	13.1087	12.9907	12.8778	12.7695	12.6655	12.5656
14.1068	13.9593	13.8190	13.6853	13.5578	13.4358	13.3190	13.2070	13.0994	12.9960
14.5754	14.4230	14.2781	14.1400	14.0081	13.8821	13.7614	13.6457	13.5346	13.4277
	14.8880	14.7384	14.5958	14.4598	14.3297	14.2051	14.0856	13.9709	13.8607
			15.0529	14.9126	14.7784	14.6500	14.5268	14.4085	14.2948
					15.2284	15.0960	14.9691	14.8472	14.7300
							15.4125	15.2870	15.1663
									15.6038

Table 8-iii. (つづき)

H \ D	68	70	72	74	76	78	80	82	84
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20	7.4542	7.3988							
21	7.8631	7.8047	7.7482	7.6938					
22	8.2739	8.2124	8.1530	8.0957	8.0403	7.9867	7.9348	7.8845	7.8357
23	8.6865	8.6219	8.5596	8.4994	8.4412	8.3849	8.3304	8.2776	8.2264
24	9.1008	9.0331	8.9678	8.9047	8.8438	8.7848	8.7277	8.6724	8.6187
25	9.5167	9.4459	9.3776	9.3117	9.2479	9.1863	9.1266	9.0687	9.0126
26	9.9341	9.8603	9.7890	9.7201	9.6536	9.5892	9.5269	9.4665	9.4080
27	10.3531	10.2761	10.2019	10.1301	10.0608	9.9937	9.9288	9.8658	9.8048
28	10.7736	10.6935	10.6162	10.5415	10.4694	10.3996	10.3320	10.2665	10.2030
29	11.1955	11.1122	11.0319	10.9543	10.8794	10.8068	10.7366	10.6685	10.6025
30	11.6188	11.5324	11.4490	11.3685	11.2907	11.2154	11.1425	11.0719	11.0034
31	12.0434	11.9538	11.8674	11.7840	11.7033	11.6253	11.5497	11.4765	11.4055
32	12.4693	12.3766	12.2871	12.2007	12.1172	12.0364	11.9582	11.8824	11.8089
33	12.8965	12.8006	12.7080	12.6187	12.5323	12.4488	12.3679	12.2895	12.2134
34	13.3249	13.2258	13.1302	13.0379	12.9486	12.8623	12.7787	12.6977	12.6191
35	13.7545	13.6522	13.5535	13.4582	13.3661	13.2770	13.1907	13.1071	13.0260
36	14.1853	14.0798	13.9780	13.8797	13.7847	13.6928	13.6038	13.5176	13.4339
37	14.6172	14.5085	14.4036	14.3023	14.2044	14.1097	14.0180	13.9291	13.8429
38	15.0502	14.9382	14.8302	14.7260	14.6252	14.5277	14.4332	14.3417	14.2530
39	15.4843	15.3691	15.2580	15.1507	15.0470	14.9467	14.8495	14.7554	14.6641
40		15.8010	15.6868	15.5765	15.4699	15.3667	15.2668	15.1701	15.0762

Table 9-i.　前橋ヒノキ *fg* 表

$\log fg = -4.235002 + 1.869028 \log D$

D	*FG*	*D*	*FG*
2	*0.0002*	52	*0.0938*
4	*0.0008*	54	*0.1007*
6	*0.0017*	56	*0.1078*
8	*0.0028*	58	*0.1151*
10	*0.0043*	60	*0.1226*
12	*0.0061*	62	*0.1303*
14	*0.0081*	64	*0.1383*
16	*0.0104*	66	*0.1465*
18	*0.0129*	68	0.1549
20	*0.0157*	70	0.1635
22	*0.0188*	72	0.1724
24	*0.0221*	74	0.1814
26	*0.0257*	76	0.1907
28	*0.0295*	78	0.2002
30	*0.0336*	80	0.2099
32	*0.0379*	82	0.2198
34	*0.0424*	84	0.2299
36	*0.0472*	86	0.2402
38	*0.0522*	88	0.2508
40	*0.0575*	90	0.2615
42	*0.0629*	92	0.2725
44	*0.0687*	94	0.2837
46	*0.0746*	96	0.2951
48	*0.0808*	98	0.3067
50	*0.0872*	100	0.3185

注）イタリックはデータの範囲

Table 9-ii.　前橋ヒノキ *fh* 表

$\log fh = -0.110186 + 0.838216 \log H$

H	*FH*	*H*	*FH*
2	1.3872	21	*9.9568*
3	*1.9487*	22	*10.3527*
4	*2.4801*	23	*10.7457*
5	*2.9902*	24	*11.1360*
6	*3.4840*	25	*11.5236*
7	*3.9645*	26	*11.9088*
8	*4.4340*	27	*12.2915*
9	*4.8941*	28	*12.6720*
10	*5.3460*	29	*13.0503*
11	*5.7906*	20	13.4264
12	*6.2288*	31	13.8006
13	*6.6610*	32	14.1728
14	*7.0879*	33	14.5431
15	*7.5099*	34	14.9116
16	*7.9273*	35	15.2784
17	*8.3406*	36	15.6434
18	*8.7499*	37	16.0069
19	*9.1556*	38	16.3687
20	*9.5578*	39	16.7290
		40	17.0878

注）イタリックはデータの範囲

Table 9-iii.　前橋ヒノキ *fh* 表

$\log fh = -0.175118 + 1.107562 \log H - 0.192392 \log D$

H \ *D*	4	6	8
2	1.1027	1.0200	0.9650
3	1.7278	1.5981	1.5121
4	*2.3761*	2.1978	2.0795
5	*3.0423*	*2.8140*	2.6625
6	3.7231	*3.4437*	*3.2583*
7	4.4162	*4.0848*	*3.8649*
8		*4.7359*	*4.4809*
9		*5.3958*	*5.1053*
10		6.0637	*5.7372*
11		6.7387	*6.3759*
12			*7.0209*
13			*7.6718*
14			
15			
16			
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40			

注）イタリックはデータの範囲

Table 9-iii. (つづき)

H \ D	10	12	14	16	18	20	22	24	26
2	0.9245								
3	1.4485								
4	1.9921	1.9234	1.8672						
5	2.5506	2.4627	2.3907	2.3301	2.2779				
6	*3.1213*	*3.0138*	2.9257	2.8515	2.7876	2.7317			
7	*3.7024*	*3.5748*	3.4704	3.3823	3.3066	3.2402	3.1813		
8	*4.2926*	*4.1446*	*4.0235*	3.9215	3.8336	3.7567	3.6884	3.6272	
9	*4.8907*	*4.7221*	*4.5842*	*4.4679*	4.3678	4.2801	4.2024	4.1326	4.0695
10	*5.4961*	*5.3066*	*5.1516*	*5.0209*	*4.9084*	4.8099	4.7225	4.6441	4.5731
11	*6.1080*	*5.8924*	*5.7251*	*5.5799*	*5.4549*	*5.3454*	*5.2483*	*5.1612*	5.0823
12	*6.7259*	*6.4941*	*6.3043*	*6.1444*	*6.0067*	*5.8862*	*5.7792*	*5.6833*	5.5965
13	*7.3494*	*7.0961*	*6.8887*	*6.7140*	*6.5636*	*6.4318*	*6.3150*	*6.2101*	6.1152
14	*7.9781*	*7.7031*	*7.4780*	*7.2883*	*7.1250*	*6.9820*	*6.8552*	*6.7414*	*6.6384*
15	8.6116	8.3148	*8.0718*	*7.8671*	*7.6908*	*7.5365*	*7.3995*	*7.2767*	*7.1655*
16	9.2497	8.9309	*8.6699*	*8.4500*	*8.2607*	*8.0949*	*7.9478*	*7.8159*	*7.6964*
17		9.5511	*9.2720*	*9.0369*	*8.8344*	*8.6571*	*8.4998*	*8.3587*	*8.2310*
18		10.1753	*9.8780*	*9.6275*	*9.4117*	*9.2229*	*9.0553*	*8.9050*	*8.7689*
19		10.8033	*10.4876*	10.2216	*9.9926*	*9.7920*	*9.6141*	*9.4545*	*9.3100*
20			11.1006	10.8191	*10.5767*	*10.3644*	*10.1761*	10.0072	*9.8543*
21				11.4198	11.1639	10.9396	10.7411	10.5628	10.4014
22				12.0236	11.7542	11.5184	11.3091	11.1213	10.9514
23					12.3474	12.0996	11.8798	11.6826	11.5040
24					12.9434	12.6836	12.4532	12.2464	12.0593
25						13.2703	13.0291	12.8129	12.6171
26							13.6076	13.3817	13.1772
27								13.9529	13.7397
28									14.3044
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

28	30	32	34	36	38	40	42	44	46
4.5084	4.4490								
5.0103	4.9443	4.8833	4.8266						
5.5172	5.4445	5.3773	5.3149	5.2568	5.2024				
6.0287	5.9492	5.8758	5.8076	5.7441	5.6847	5.6289	5.5763		
6.5444	*6.4581*	*6.3784*	6.3044	6.2355	6.1710	6.1104	6.0533	5.9993	5.9482
7.0641	*6.9709*	*6.8849*	6.8051	6.7306	6.6610	6.5956	6.5340	6.4757	6.4206
7.5875	*7.4874*	*7.3950*	*7.3093*	7.2294	*7.1545*	7.0843	7.0181	6.9556	6.8963
8.1145	*8.0075*	*7.9086*	*7.8169*	7.7314	*7.6514*	7.5763	*7.5055*	7.4386	7.3753
8.6448	*8.5308*	*8.4254*	*8.3278*	*8.2367*	*8.1515*	*8.0714*	*7.9960*	7.9248	7.8573
9.1782	*9.0572*	*8.9455*	*8.8417*	*8.7450*	*8.6545*	*8.5695*	*8.4895*	8.4138	8.3422
9.7148	*9.5867*	*9.4684*	*9.3586*	*9.2562*	*9.1604*	*9.0705*	*8.9857*	8.9057	8.8298
10.2542	*10.1190*	*9.9941*	9.8782	*9.7702*	*9.6691*	*9.5741*	*9.4847*	9.4002	9.3201
10.7963	*10.6540*	*10.5225*	10.4005	*10.2868*	*10.1803*	*10.0803*	*9.9862*	9.8972	9.8129
11.3412	11.1916	*11.0535*	10.9254	*10.8059*	*10.6941*	*10.5890*	*10.4901*	*10.3966*	10.3081
11.8886	11.7318	*11.5871*	11.4527	*11.3274*	*11.2102*	*11.1001*	10.9964	10.8984	*10.8056*
12.4384	12.2744	*12.1230*	11.9824	*11.8513*	*11.7287*	*11.6135*	11.5050	11.4025	*11.3054*
12.9907	12.8194	*12.6612*	12.5144	*12.3775*	*12.2494*	12.1291	12.0158	11.9087	11.8073
13.5452	13.3666	13.2016	13.0485	12.9058	*12.7723*	12.6469	12.5287	12.4171	12.3113
14.1019	13.9160	13.7442	13.5849	13.4363	13.2972	13.1667	13.0437	12.9274	12.8173
14.6608	14.4675	14.2889	14.1232	13.9688	13.8242	13.6885	13.5606	13.4398	13.3253
	15.0210	14.8357	14.6636	14.5033	14.3532	14.2122	14.0794	13.9540	13.8352
		15.3843	15.2059	15.0396	14.8840	14.7379	14.6002	14.4701	14.3468
			15.7502	15.5779	15.4167	15.2653	15.1227	14.9879	14.8603
					15.9512	15.7945	15.6470	15.5076	15.3755
							16.1730	16.0289	15.8924
									16.4109

Table 9-iii. (つづき)

H \ D	48	50	52	54	56	58	60	62	64
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15	6.3682	6.3184							
16	6.8401	6.7866	6.7356	6.6868					
17	7.3152	7.2579	7.2034	7.1513	7.1014	7.0536			
18	7.7932	7.7323	7.6741	7.6186	7.5655	7.5146	7.4657	7.4188	7.3736
19	8.2742	8.2094	8.1477	8.0888	8.0324	7.9783	7.9265	7.8766	7.8286
20	8.7578	8.6893	8.6240	8.5616	8.5019	*8.4447*	8.3898	8.3370	8.2863
21	9.2441	9.1718	9.1028	9.0370	8.9740	*8.9136*	8.8556	8.8000	*8.7464*
22	9.7329	9.6567	*9.5841*	9.5148	9.4485	*9.3849*	*9.3239*	9.2652	9.2088
23	10.2240	10.1441	*10.0678*	9.9950	9.9258	*9.8585*	9.7944	9.7328	9.6735
24	*10.7175*	*10.6337*	*10.5537*	10.4774	10.4043	10.3343	10.2671	10.2026	10.1404
25	*11.2132*	11.1255	*11.0419*	10.9620	10.8855	10.8123	10.7420	10.6745	10.6094
26	11.7110	11.6194	11.5321	11.4486	11.3688	11.2923	11.2189	11.1484	11.0805
27	12.2109	12.1154	12.0243	11.9373	11.8541	11.7743	11.6978	11.6242	11.5535
28	12.7128	12.6134	12.5186	12.4280	12.3413	12.2583	12.1786	12.1020	12.0283
29	13.2116	13.1133	13.0147	*12.9205*	12.8304	12.7441	12.6612	12.5816	12.5050
30	13.7223	13.6150	13.5126	13.4149	13.3213	13.2317	13.1457	13.0630	12.9835
31	14.2299	14.1185	14.0124	13.9110	13.8140	13.7211	13.6319	13.5461	13.4637
32	14.7391	14.6238	14.5139	14.4089	14.3084	14.2121	14.1197	14.0310	13.9455
33	15.2501	15.1308	15.0171	14.9084	14.8045	14.7049	14.6093	14.5174	14.4290
34	15.7626	15.6395	15.5219	15.4096	15.3022	15.1992	15.1004	15.0054	14.9140
35	16.2771	16.1497	16.0283	15.9124	15.8014	15.6951	15.5931	15.4950	15.4006
36			16.5363	16.4167	16.3022	16.1925	16.0872	15.9861	15.8887
37				16.9225	16.8045	16.6914	16.5829	16.4786	16.3783
38						17.1918	17.0800	16.9726	16.8693
39								17.4680	17.3616
30									

66	68	70	72	74	76	78	80	82	84
7.7824	7.7379								
8.2374	8.1902	8.1446	8.1006	8.0580					
8.6947	8.6449	8.5969	8.5504	8.5054	8.4619	8.4197	8.3788	8.3391	8.3005
9.1545	9.1020	9.0514	9.0025	8.9552	8.9093	8.8649	8.8218	8.7800	8.7394
9.6164	9.5082	9.4568	9.4071	9.3589	9.3123	9.2670	9.2231	9.1805	9.1390
10.0806	10.0229	9.9671	9.9132	9.8611	9.8107	9.7618	9.7143	9.6683	9.6236
10.5468	10.4864	10.4281	10.3717	10.3172	10.2644	10.2132	10,1636	10.1154	10.0687
11.0151	10.9520	10.8917	10.8322	10.7753	10.7201	10.6667	10.6148	10.5645	10.5157
11.4853	11.4195	11.3560	11.2946	11.2352	11.1777	11.1220	11.0679	11.0155	10.9645
11.9573	11.8888	11.8227	11.7588	11.6970	11.6371	11.5791	11.5229	11.4682	11.4152
12.4312	12.3600	12.2913	12.2248	12.1606	12.0983	12.0380	11.9795	11.9227	11.8676
12.9068	12.8329	12.7616	12.6926	12.6258	12.5612	12.4986	12.4379	12.3789	12.3217
13.3842	13.3075	13.2335	13.1620	13.0928	13.0258	12.9609	12.8979	12.8368	12.7774
13.8632	13.7838	13.7071	13.6331	13.5614	13.4920	13.4247	13.3595	13.2962	13.2347
14.3438	14.2617	14.1824	14.1057	14.0315	13.9597	13.8901	13.8226	13.7571	13.6935
14.8260	14.7411	14.6591	14.5799	14.5032	14.4290	14.3571	14.2873	14.2196	14.1538
15.3097	15.2221	15.1374	15.0556	14.9764	14.8998	14.8255	14.7535	14.6835	14.6156
15.7949	15.7045	15.6171	15.5327	15.4511	15.3720	15.2954	15.2210	15.1489	15.0788
16.2816	16.1884	16.0983	16.0113	15.9271	15.8456	15.7666	15.6900	15.6157	15.5434
16.7697	16.6736	16.5809	16.4913	16.4046	16.3206	16.2393	16.1604	16.0838	16.0094
17.2591	17.1603	17.0649	16.9726	16.8834	16.7970	16.7133	16.6320	16.5532	16.4766
17.7500	17.6483	17.5501	17.4553	17.3635	17.2747	17.1885	17.1050	17.0240	16.9452

Table 10-i. 前橋アカマツ fg 表

$\log fg = -4.207352 + 1.844109 \log D$

D	FD	D	FD
2	0.0002	52	*0.0906*
4	*0.0008*	54	*0.0971*
6	*0.0017*	56	*0.1039*
8	*0.0029*	58	*0.1108*
10	*0.0043*	60	*0.1180*
12	*0.0061*	62	*0.1253*
14	*0.0081*	64	*0.1329*
16	*0.0103*	66	*0.1406*
18	*0.0128*	68	*0.1486*
20	*0.0156*	70	*0.1568*
22	*0.0185*	72	*0.1651*
24	*0.0218*	74	*0.1737*
26	*0.0252*	76	*0.1824*
28	*0.0289*	78	*0.1914*
30	*0.0329*	80	*0.2005*
32	*0.0370*	82	*0.2099*
34	*0.0414*	84	*0.2194*
36	*0.0460*	86	0.2291
38	*0.0508*	88	0.2391
40	*0.0559*	90	0.2492
42	*0.0611*	92	0.2595
44	*0.0666*	94	0.2700
46	*0.0723*	96	0.2807
48	*0.0782*	98	0.2915
50	*0.0843*	100	0.3026

注）イタリックはデータの範囲

Table 10-ii. 前橋アカマツ fh 表

$\log fh = -0.058020 + 0.783902 \log H$

H	FH	H	FH
2	1.5065	21	*9.5164*
3	2.0701	22	*9.8698*
4	2.5938	23	*10.2198*
5	3.0896	24	*10.5665*
6	*3.5643*	25	*10.9101*
7	*4.0221*	26	*11.2507*
8	*4.4660*	27	*11.5886*
9	*4.8979*	28	*11.9237*
10	*5.3196*	29	*12.2562*
11	*5.7323*	30	12.5863
12	*6.1370*	31	12.9140
13	*6.5344*	32	13.2395
14	*6.9252*	33	13.5627
15	*7.3101*	34	13.8838
16	*7.6894*	35	14.2029
17	*8.0636*	36	14.5201
18	*8.4332*	37	14.8353
19	*8.7983*	38	15.1487
20	*9.1593*	39	15.4603
		40	15.7702

注）イタリックはデータの範囲

Table 10-iii.

$\log fh$

H \ D	4	6	8
2	1.2390	1.1669	1.1183
3	1.8633	1.7549	1.6818
4	2.4889	2.3441	2.2465
5	3.1155	2.9343	2.8121
6	3.7429	*3.5252*	*3.3784*
7	4.3710	*4.1167*	*3.9453*
8	4.9996	4.7088	*4.5127*
9	5.6288	5.3013	*5.0806*
10	*6.2584*	5.8943	*5.6489*
11	6.8883	6.4876	*6.2175*
12	7.5187	7.0813	*6.7864*
13	8.1494	7.6753	*7.3557*
14		8.2695	7.9252
15		8.8641	8.4950
16			9.0651
17			9.6353
18			
19			
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注）イタリックはデータの範囲

前橋アカマツ *fh* 表

$=-0.120859+1.006318\log H-0.147824\log D$

10	12	14	16	18	20	22	24	26	28
1.0821	1.0533	1.0296	1.0094	0.9920	0.9767	0.9630			
1.6272	1.5840	1.5483	1.5180	1.4918	1.4688	1.4482			
2.1736	2.1158	2.0681	2.0277	1.9927	1.9619	1.9345			
2.7208	2.6485	2.5888	2.5382	2.4944	2.4559	2.4215	2.3906	2.3624	2.3367
3.2688	3.1819	3.1102	3.0494	2.9967	2.9504	2.9092	2.8720	2.8382	2.8073
3.8173	*3.7158*	3.6321	3.5611	3.4996	3.4455	3.3973	3.3539	3.3145	3.2783
4.3663	*4.2502*	*4.1544*	4.0732	4.0029	3.9411	3.8859	3.8363	3.7911	3.7498
4.9157	*4.7850*	*4.6772*	4.5858	4.5066	4.4370	4.3749	4.3190	4.2682	4.2217
5.4656	*5.3202*	*5.2004*	5.0987	5.0107	4.9333	4.8643	4.8021	4.7456	4.6939
6.0157	*5.8558*	*5.7239*	5.6120	*5.5151*	*5.4299*	*5.3539*	5.2855	5.2233	5.1664
6.5662	*6.3916*	*6.2476*	*6.1255*	*6.0198*	*5.9268*	*5.8438*	*5.7692*	*5.7013*	*5.6392*
7.1170	*6.9278*	*6.7717*	*6.6393*	*6.5247*	*6.4239*	*6.3340*	*6.2531*	*6.1795*	*6.1122*
7.6681	*7.4642*	*7.2960*	*7.1534*	*7.0299*	*6.9213*	*6.8245*	*6.7372*	*6.6580*	*6.5855*
8.2194	*8.0008*	*7.8206*	*7.6677*	*7.5354*	*7.4189*	*7.3151*	*7.2216*	*7.1367*	*7.0589*
8.7709	8.5377	*8.3453*	*8.1822*	*8.0410*	*7.9167*	*7.8060*	*7.7062*	*7.6156*	*7.5326*
9.3227	9.0748	*8.8703*	*8.6969*	*8.5468*	*8.4147*	*8.2970*	*8.1910*	*8.0946*	*8.0064*
9.8746	9.6120	*9.3955*	*9.2118*	*9.0528*	*8.9129*	*8.7882*	*8.6759*	*8.5739*	*8.4805*
	10.1495	9.9208	*9.7269*	*9.5590*	*9.4113*	*9.2797*	*9.1611*	*9.0533*	*8.9547*
	10.6872	10.4464	*10.2422*	*10.0654*	*9.9099*	*9.7712*	*9.6463*	*9.5329*	*9.4290*
	11.2250	10.9721	10.7576	10.5719	10.4086	*10.2629*	10.1318	*10.0126*	*9.9035*
		11.4979	11.2732	11.0786	10.9074	*10.7548*	10.6174	*10.4925*	*10.3782*
		12.0240	11.7889	11.5855	11.4064	11.2468	11.1031	10.9725	10.8529
		12.5501	12.3048	12.0924	11.9055	11.7390	11.5890	11.4526	11.3279
		13.0764	12.8208	12.5995	12.4048	12.2313	12.0749	11.9329	11.8029
					12.9042	12.7237	12.5611	12.4133	12.2781
						13.2162	13.0473	12.8938	12.7533
						13.7088	13.5336	13.3744	13.2287
							14.0201	13.8552	13.7042
									14.1798

Table 10–iii. (つづき)

H \ D	30	32	34	36	38	40	42	44	46
2									
3									
4									
5	2.3130								
6	2.7788	2.7524	2.7278	2.7049	2.6834	2.6631	2.6440		
7	3.2451	3.2143	3.1856	3.1588	3.1336	3.1100	3.0876	3.0665	3.0464
8	3.7118	3.6765	3.6437	3.6131	3.5843	3.5573	3.5317	3.5075	3.4845
9	4.1789	4.1392	4.1023	4.0677	4.0354	4.0049	3.9761	3.9489	3.9230
10	4.6463	4.6022	4.5611	4.5227	4.4867	4.4526	4.4208	4.3905	4.3618
11	5.1140	5.0654	5.0202	4.9780	4.9384	4.9011	4.8658	4.8325	4.8009
12	*5.5820*	5.5290	5.4796	5.4335	5.3903	5.3496	5.3111	5.2747	5.2402
13	*6.0502*	5.9927	*5.9393*	5.8893	5.8424	5.7983	5.7566	5.7172	5.6797
14	*6.5186*	6.4567	*6.3991*	*6.3453*	6.2948	*6.2472*	6.2023	*6.1598*	6.1195
15	*6.9873*	6.9210	*6.8592*	*6.8015*	6.7473	*6.6964*	6.6483	*6.6027*	6.5595
16	*7.4562*	7.3854	*7.3195*	*7.2579*	7.2001	*7.1457*	7.0944	*7.0457*	6.9996
17	*7.9252*	*7.8499*	*7.7799*	*7.7145*	*7.6530*	*7.5952*	*7.5407*	*7.4890*	7.4399
18	*8.3944*	*8.3147*	*8.2405*	*8.1712*	*8.1062*	*8.0449*	*7.9871*	*7.9324*	7.8804
19	*8.8638*	*8.7796*	*8.7013*	*8.6281*	*8.5594*	*8.4948*	*8.4337*	*8.3759*	*8.3211*
20	*9.3333*	*9.2447*	*9.1622*	*9.0852*	*9.0128*	*8.9448*	*8.8805*	*8.8196*	*8.7618*
21	*9.8030*	*9.7100*	*9.6233*	*9.5424*	9.4664	*9.3949*	*9.3274*	*9.2634*	*9.2028*
22	*10.2729*	*10.1753*	*10.0845*	*9.9997*	9.9201	*9.8452*	9.7744	*9.7074*	*9.6438*
23	*10.7428*	10.6408	*10.5459*	10.4572	10.3739	*10.2955*	10.2216	*10.1515*	*10.0850*
24	*11.2129*	11.1065	11.0074	10.9147	10.8279	*10.7461*	10.6688	10.5957	10.5263
25	*11.6831*	11.5722	11.4690	11.3725	11.2819	*11.1967*	11.1162	11.0401	10.9678
26	12.1535	12.0381	11.9307	11.8303	11.7361	*11.6475*	11.5638	11.4845	11.4093
27	12.6239	12.5041	12.3925	12.2882	12.1904	*12.0983*	12.0114	11.9291	11.8509
28	13.0945	12.9702	12.8544	12.7463	12.6448	*12.5493*	12.4591	12.3737	12.2927
29	13.5652	13.4363	13.3165	13.2044	13.0993	*13.0004*	12.9069	12.8185	12.7345
30	14.0359	13.9026	13.7786	13.6627	13.5539	13.4515	13.3549	13.2633	13.1765
31	14.5068	14.3690	14.2409	14.1210	14.0086	13.9028	13.8029	13.7083	13.6185
32				14.5795	14.4634	14.3542	14.2510	14.1533	14.0606
33								14.5985	14.5029
34									
35									
36									
37									
38									
39									
40									

48	50	52	54	56	58	60	62	64	66
3.4627	3.4418								
3.8984	3.8749	3.8525	3.8311						
4.3344	4.3083	4.2834	4.2596	4.2368	4.2149				
4.7707	4.7420	4.7145	4.6884	4.6633	4.6391	4.6159	4.5936		
5.2073	5.1760	5.1461	5.1174	5.0900	5.0637	5.0383	5.0140	4.9905	4.9679
5.6441	5.6101	5.5777	5.5467	5.5169	5.4884	5.4610	5.4346	5.4091	5.3846
6.0811	*6.0445*	6.0096	5.9761	5.9441	5.9134	5.8838	5.8553	5.8279	5.8015
6.5183	*6.4791*	6.4416	6.4058	6.3715	6.3385	6.3068	6.2763	6.2469	6.2186
6.9557	*6.9139*	*6.8739*	6.8356	6.7990	6.7638	6.7300	6.6975	6.6661	6.6359
7.3933	*7.3488*	*7.3063*	7.2657	7.2267	7.1893	7.1534	7.1188	7.0855	7.0533
7.8310	*7.7839*	*7.7389*	7.6958	7.6546	7.6150	7.5769	7.5403	7.5050	7.4709
8.2689	*8.2191*	*8.1716*	*8.1261*	8.0826	*8.0408*	8.0006	7.9619	7.9246	7.8886
8.7069	*8.6545*	*8.6045*	*8.5566*	8.5107	*8.4667*	8.4244	8.3836	8.3444	*8.3065*
9.1451	*9.0900*	*9.0375*	*8.9872*	8.9390	*8.8928*	8.8483	*8.8055*	8.7643	*8.7245*
9.5834	*9.5257*	*9.4706*	*9.4179*	9.3674	*9.3190*	*9.2724*	*9.2276*	*9.1844*	*9.1427*
10.0218	*9.9615*	*9.9039*	*9.8488*	9.7960	*9.7453*	*9.6966*	*9.6497*	*9.6045*	9.5609
10.4603	10.3974	10.3373	*10.2798*	10.2247	10.1717	*10.1209*	*10.0720*	10.0248	9.9793
10.8990	10.8334	10.7708	*10.7109*	10.6534	10.5983	*10.5453*	*10.4943*	10.4452	10.3978
11.3377	11.2695	11.2044	*11.1420*	11.0823	11.0250	*10.9699*	*10.9168*	10.8657	10.8164
11.7766	11.7058	11.6381	*11.5733*	11.5113	11.4517	*11.3945*	*11.3394*	11.2863	11.2351
12.2156	12.1421	12.0719	*12.0047*	11.9404	11.8786	*11.8192*	*11.7621*	11.7070	11.6539
12.6547	12.5785	12.5058	12.4362	12.3696	12.3056	12.2441	12.1848	12.1278	12.0728
13.0938	13.0151	12.9398	12.8678	12.7988	12.7326	12.6690	12.6077	12.5487	12.4917
13.5331	13.4517	13.3739	13.2995	13.2282	13.1598	13.0940	13.0307	12.9697	12.9108
13.9725	13.8884	13.8081	13.7313	13.6577	13.5870	13.5191	13.4537	13.3907	13.3299
14.4119	14.3252	14.2424	14.1631	14.0872	14.0143	13.9443	13.8768	13.8119	13.7492
	14.7621	14.6767	14.5951	14.5168	14.4417	14.3695	14.3000	14.2331	14.1685
						14.7949	14.7233	14.6544	14.5879
								15.0758	15.0074
									15.4269

Table 10-iii. （つづき）

H \ D	68	70	72	74	76	78	80	82	84
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13	5.3609	5.3379	5.3157	5.2943	5.2734				
14	5.7759	5.7512	5.7273	5.7042	5.6817	5.6600	5.6388	5.6183	5.5983
15	6.1912	6.1647	6.1391	6.1143	6.0902	6.0669	6.0442	6.0222	6.0008
16	6.6066	6.5784	6.5510	6.5246	6.4989	6.4740	6.4498	6.4263	6.4035
17	7.0222	6.9922	6.9632	6.9350	6.9077	6.8812	6.8555	6.8306	6.8063
18	7.4380	7.4062	7.3754	7.3456	7.3167	7.2887	7.2614	7.2350	7.2092
19	7.8539	7.8203	7.7878	7.7563	7.7258	7.6962	7.6675	7.6395	7.6124
20	8.2699	8.2346	*8.2004*	8.1672	8.1351	8.1039	8.0736	8.0442	8.0156
21	8.6861	8.6490	8.6130	8.5782	8.5445	8.5117	8.4799	8.4490	8.4190
22	9.1024	9.0635	9.0258	8.9893	8.9540	8.9197	8.8863	*8.8540*	8.8225
23	9.5188	9.4781	9.4387	9.4006	9.3636	9.3277	9.2929	*9.2590*	9.2261
24	9.9354	9.8929	9.8518	9.8120	9.7733	9.7359	9.6995	*9.6642*	9.6298
25	10.3520	10.3077	10.2649	10.2234	10.1832	10.1442	10.1063	*10.0695*	10.0336
26	10.7688	10.7227	10.6782	10.6350	10.5931	10.5525	10.5131	*10.4748*	10.4376
27	11.1856	11.1378	11.0915	11.0467	11.0032	10.9610	10.9201	10.8803	10.8416
28	*11.6026*	11.5529	11.5049	11.4584	11.4133	11.3696	11.3271	11.2859	11.2457
29	12.0196	11.9682	11.9185	11.8703	11.8236	11.7783	11.7343	11.6915	*11.6499*
30	12.4367	12.3835	12.3321	12.2822	12.2339	12.1870	12.1415	12.0973	12.0543
31	12.8539	12.7990	12.7458	12.6943	12.6443	12.5959	12.5488	12.5031	12.4586
32	13.2713	13.2145	13.1596	13.1064	13.0548	13.0048	12.9562	12.9090	12.8631
33	13.6886	13.6301	13.5735	13.5186	13.4654	13.4138	13.3637	13.3150	13.2677
34	14.1061	14.0458	13.9874	13.9309	13.8761	13.8229	13.7713	13.7211	13.6723
35	14.5237	14.4616	14.4015	14.3432	14.2868	14.2321	14.1789	14.1272	14.0770
36	14.9413	14.8774	14.8156	14.7557	14.6976	14.6413	14.5866	14.5335	14.4818
37	15.3590	15.2933	15.2297	15.1682	15.1085	15.0506	14.9944	14.9397	14.8866
38		15.7093	15.6440	15.5808	15.5195	15.4600	15.4022	15.3461	15.2915
39				15.9934	15.9305	15.8694	15.8101	15.7525	15.6965
40							16.2181	16.1590	16.1016

86	88	90	92	94	96	98	100		
5.5789	5.5599								
5.9800	5.9597	5.9399	5.9206	5.9018					
6.3812	6.3596	6.3385	6.3179	6.2979	6.2783	6.2592	6.2405		
6.7826	6.7596	6.7372	6.7154	6.6940	6.6732	6.6529	6.6331		
7.1842	7.1598	7.1361	7.1129	7.0904	7.0683	7.0468	7.0258		
7.5859	7.5602	7.5351	7.5107	7.4868	7.4636	7.4409	7.4187		
7.9878	7.9607	7.9343	7.9085	7.8834	7.8589	7.8350	7.8117		
8.3898	8.3613	8.3336	8.3065	8.2802	8.2544	8.2293	8.2048		
8.7918	8.7620	8.7330	8.7046	8.6770	8.6500	8.6237	8.5980		
9.1941	9.1629	9.1325	9.1029	9.0740	9.0458	9.0182	8.9913		
9.5964	9.5638	9.5321	9.5012	9.4710	9.4416	9.4129	9.3848		
9.9988	9.9649	9.9318	9.8996	9.8682	9.8375	9.8076	9.7783		
10.4013	10.3660	10.3317	10.2982	10.2655	10.2336	10.2024	10.1720		
10.8040	10.7673	10.7316	10.6968	10.6628	10.6297	10.5974	10.5657		
11.2067	11.1687	11.1316	11.0955	11.0603	11.0259	10.9924	10.9596		
11.6095	11.5701	11.5317	11.4943	11.4578	11.4222	11.3875	11.3535		
12.0124	11.9716	11.9319	11.8932	11.8555	11.8186	11.7827	11.7475		
12.4154	12.3733	12.3322	12.2922	12.2532	12.2151	12.1780	12.1416		
12.8184	12.7750	12.7326	12.6913	12.6510	12.6117	12.5733	12.5358		
13.2216	13.1767	13.1330	13.0904	13.0489	13.0083	12.9687	12.9301		
13.6248	13.5786	13.5336	13.4897	13.4468	13.4051	13.3643	13.3244		
14.0281	13.9805	13.9342	13.8890	13.8449	13.8019	13.7598	13.7188		
14.4315	14.3825	14.3348	14.2883	14.2430	14.1987	14.1555	14.1133		
14.8349	14.7846	14.7356	14.6878	14.6411	14.5957	14.5512	14.5078		
15.2384	15.1867	15.1364	15.0873	15.0394	14.9927	14.9470	14.9025		
15.6420	15.5890	15.5372	15.4869	15.4377	15.3897	15.3429	15.2971		
16.0457	15.9912	15.9382	15.8865	15.8361	15.7869	15.7388	15.6919		

Table 11-i. 前橋広葉樹 *fg* 表

$\log fg = -4.274098 + 1.875948 \log D$

D	*FG*	*D*	*FG*
2	0.0002	56	*0.1013*
4	*0.0007*	58	*0.1081*
6	*0.0015*	60	*0.1152*
8	*0.0026*	62	*0.1226*
10	*0.0040*	64	*0.1301*
12	*0.0056*	66	*0.1378*
14	*0.0075*	68	*0.1457*
16	*0.0097*	70	*0.1539*
18	*0.0120*	72	*0.1622*
20	*0.0147*	74	*0.1708*
22	*0.0176*	76	*0.1796*
24	*0.0207*	78	*0.1885*
26	*0.0240*	80	*0.1977*
28	*0.0276*	82	*0.2071*
30	*0.0314*	84	*0.2167*
32	*0.0354*	86	*0.2264*
34	*0.0397*	88	*0.2364*
36	*0.0442*	90	*0.2466*
38	*0.0489*	92	*0.2570*
40	*0.0539*	94	*0.2675*
42	*0.0590*	96	*0.2783*
44	*0.0644*	98	0.2893
46	*0.0700*	100	0.3005
48	*0.0758*	102	0.3118
50	*0.0819*	104	0.3234
52	*0.0881*	106	0.3352
54	*0.0946*	108	0.3471
		110	0.3593

注）イタリックはデータの範囲

Table 11-ii. 前橋広葉樹 *fh* 表

$\log fh = -0.133678 + 0.825000 \log H$

H	*FH*	*H*	*FH*
2	1.3022	22	*9.4150*
3	1.8195	23	*9.7667*
4	2.3069	24	*10.1157*
5	*2.7731*	25	*10.4622*
6	*3.2233*	26	*10.8063*
7	*3.6604*	27	*11.1480*
8	*4.0867*	28	*11.4876*
9	*4.5037*	29	*11.8250*
10	*4.9127*	30	*12.1604*
11	*5.3146*	31	*12.4938*
12	*5.7101*	32	*12.8254*
13	*6.0999*	33	*13.1552*
14	*6.4845*	34	*13.4832*
15	*6.8643*	35	*13.8095*
16	*7.2397*	36	14.1342
17	*7.6110*	37	14.4573
18	*7.9785*	38	14.7790
19	*8.3425*	39	15.0991
20	*8.7031*	40	15.4178
21	*9.0605*		

注）イタリックはデータの範囲

Table 11-iii. 前

$\log fh = -0.156455 + 0.978592 \log H$

H \ *D*	4	6	8
2	1.1730	1.1198	
3	1.7443	1.6652	1.6113
4	2.3114	2.2067	2.1353
5	*2.8755*	*2.7452*	2.6564
6	*3.4371*	*3.2814*	3.1752
7	*3.9968*	*3.8157*	*3.6922*
8	*4.5547*	*4.3483*	*4.2076*
9		*4.8796*	*4.7217*
10		*5.4095*	*5.2345*
11			*5.7462*
12			*6.2569*
13			6.7667
14			7.2756
15			7.7838
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注）イタリックはデータの範囲

橋広葉樹 *fh* 表

$-0.114347 \log D$

10	12	14	16	18	20	22	24	26	28
1.5707	1.5383								
2.0815	2.0385								
2.5894	2.5360	2.4917	2.4539	2.4211	2.3921				
3.0952	3.0314	2.9784	2.9333	2.8940	2.8594	2.8284	2.8004	2.7749	2.7514
3.5992	*3.5249*	3.4633	3.4109	3.3652	3.3249	3.2889	3.2563	3.2267	3.1994
4.1016	*4.0170*	3.9468	3.8870	*3.8350*	3.7891	3.7480	3.7109	3.6771	3.6461
4.6027	*4.5077*	*4.4290*	4.3619	*4.3035*	*4.2520*	4.2059	4.1642	4.1263	4.0915
5.1026	*4.9973*	*4.9100*	*4.8356*	*4.7709*	*4.7138*	4.6627	4.6165	4.5745	4.5359
5.6014	*5.4858*	*5.3900*	*5.3083*	*5.2373*	*5.1746*	*5.1185*	5.0678	5.0216	4.9793
6.0993	*5.9734*	*5.8690*	*5.7801*	*5.7028*	*5.6345*	*5.5734*	*5.5182*	*5.4680*	5.4218
6.5962	*6.4601*	*6.3472*	*6.2511*	*6.1674*	*6.0936*	*6.0275*	*5.9679*	*5.9135*	*5.8636*
7.0923	*6.9460*	*6.8247*	*6.7212*	*6.6313*	*6.5519*	*6.4808*	*6.4167*	*6.3583*	*6.3046*
7.5877	*7.4312*	*7.3013*	*7.1907*	*7.0945*	*7.0095*	*6.9336*	*6.8649*	*6.8024*	*6.7450*
8.0824	*7.9156*	*7.7773*	*7.6595*	*7.5570*	*7.4665*	*7.3856*	*7.3125*	*7.2459*	*7.1847*
8.5764	*8.3995*	*8.2527*	*8.1277*	*8.0189*	*7.9229*	*7.8370*	*7.7594*	*7.6887*	*7.6239*
9.0698	8.8827	*8.7275*	*8.5952*	*8.4802*	*8.3787*	*8.2879*	*8.2058*	*8.1311*	*8.0624*
9.5626	9.3653	9.2017	*9.0622*	*8.9410*	*8.8339*	*8.7382*	*8.6517*	*8.5729*	*8.5005*
10.0549	9.8474	9.6753	*9.5287*	*9.4013*	*9.2887*	*9.1880*	*9.0970*	*9.0142*	*8.9381*
			9.9947	*9.8610*	*9.7429*	*9.6373*	*9.5419*	*9.4550*	*9.3752*
			10.4602	*10.3203*	*10.1967*	*10.0862*	*9.9863*	*9.8954*	*9.8119*
			10.9253	*10.7792*	*10.6501*	*10.5346*	*10.4303*	*10.3353*	*10.2481*
			11.3899	11.2376	*11.1030*	10.9826	*10.8739*	*10.7748*	*10.6839*
			11.8542	11.6956	11.5555	11.4303	*11.3171*	*11.2140*	*11.1194*
					12.0076	11.8775	*11.7599*	*11.6528*	11.5544
					12.4594	12.3244	*12.2023*	12.0912	11.9891
					12.9108	12.7709	*12.6444*	12.5292	12.4235
					13.3619	13.2170	*13.0862*	12.9670	12.8575
					13.8126	13.6629	13.5276	13.4044	13.2913

Table 11-iii. (つづき)

H \ D	30	32	34	36	38	40	42	44	46
2									
3									
4									
5									
6	2.7298	2.7097	2.6910	2.6735	2.6570	2.6415	2.6268	2.6129	2.5996
7	3.1743	3.1510	3.1292	3.1088	3.0896	3.0716	3.0545	3.0383	3.0229
8	3.6174	3.5908	3.5660	3.5428	3.5209	3.5004	3.4809	3.4624	3.4449
9	4.0593	4.0295	4.0017	3.9756	3.9511	3.9280	3.9061	3.8854	3.8657
10	4.5002	4.4671	4.4363	4.4074	4.3802	4.3546	4.3304	4.3074	4.2855
11	4.9401	*4.9038*	4.8699	4.8382	4.8084	4.7803	4.7537	4.7285	4.7045
12	5.3792	*5.3397*	5.3028	5.2682	5.2358	5.2051	5.1762	5.1487	5.1226
13	*5.8175*	*5.7747*	*5.7348*	5.6975	5.6624	5.6293	5.5979	5.5682	5.5400
14	*6.2551*	*6.2091*	*6.1662*	6.1260	*6.0883*	6.0527	*6.0190*	5.9871	5.9567
15	*6.6920*	*6.6428*	*6.5969*	*6.5539*	*6.5135*	*6.4754*	*6.4394*	6.4052	6.3728
16	*7.1283*	*7.0758*	*7.0270*	*6.9812*	*6.9382*	*6.8976*	*6.8592*	6.8228	6.7882
17	*7.5639*	*7.5083*	*7.4565*	*7.4079*	*7.3622*	*7.3192*	*7.2785*	*7.2398*	*7.2031*
18	*7.9991*	*7.9403*	*7.8854*	*7.8341*	*7.7858*	*7.7402*	*7.6972*	*7.6563*	*7.6175*
19	*8.4337*	*8.3717*	*8.3139*	*8.2597*	*8.2088*	*8.1608*	*8.1154*	*8.0723*	*8.0314*
20	*8.8679*	*8.8026*	*8.7418*	*8.6849*	*8.6314*	*8.5809*	*8.5331*	*8.4879*	*8.4448*
21	*9.3015*	*9.2331*	*9.1693*	*9.1096*	*9.0535*	*9.0005*	*8.9504*	*8.9030*	*8.8578*
22	*9.7348*	*9.6632*	*9.5964*	*9.5339*	*9.4751*	*9.4197*	*9.3673*	*9.3176*	*9.2704*
23	*10.1676*	*10.0928*	*10.0231*	*9.9578*	*9.8964*	*9.8385*	*9.7838*	*9.7319*	*9.6826*
24	*10.6000*	*10.5220*	*10.4493*	*10.3813*	*10.3173*	*10.2569*	*10.1999*	*10.1458*	*10.0943*
25	*11.0320*	*10.9509*	*10.8752*	*10.8044*	*10.7378*	*10.6750*	*10.6156*	*10.5593*	*10.5057*
26	*11.4636*	*11.3793*	*11.3007*	*11.2271*	*11.1579*	*11.0927*	*11.0310*	*10.9724*	*10.9168*
27	*11.8949*	*11.8075*	*11.7259*	*11.6495*	*11.5777*	*11.5100*	*11.4460*	*11.3852*	*11.3275*
28	*12.3259*	*12.2353*	*12.1507*	*12.0716*	*11.9972*	*11.9270*	*11.8607*	*11.7977*	*11.7379*
29	*12.7565*	*12.6627*	12.5752	*12.4933*	*12.4163*	*12.3437*	*12.2750*	*12.2099*	*12.1480*
30	13.1868	*13.0899*	12.9994	12.9147	*12.8351*	*12.7601*	*12.6891*	*12.6218*	*12.5578*
31	13.6168	*13.5167*	13.4233	13.3359	*13.2537*	*13.1762*	13.1029	*13.0333*	12.9673
32	14.0465	13.9432	13.8469	13.7567	*13.6719*	*13.5920*	13.5163	*13.4446*	13.3765
33	14.4759	14.3695	14.2702	14.1773	*14.0899*	14.0075	13.9295	*13.8556*	13.7854
34	14.9051	14.7955	14.6933	14.5975	14.5076	14.4227	14.3425	*14.2664*	14.1941
35	15.3339	15.2212	15.1160	15.0176	14.9250	14.8377	14.7552	14.6769	14.6025
36	15.7625	15.6466	15.5385	15.4373	15.3422	15.2524	15.1676	15.0871	15.0106
37	16.1909	16.0718	15.9608	15.8568	15.7591	15.6669	15.5798	15.4971	15.4185
38	16.6190	16.4968	16.3828	16.2761	16.1758	16.0812	15.9917	15.9069	15.8262
39	17.0468	16.9215	16.8046	16.6951	16.5922	16.4952	16.4034	16.3164	16.2337
40	17.4745	17.3460	17.2261	17.1139	17.0084	16.9090	16.8149	16.7257	16.6409

48	50	52	54	56	58	60	62	64	66
2.5870	2.5749	2.5634	2.5524	2.5418	2.5316	2.5218			
3.0082	2.9942	2.9680	2.9680	2.9556	2.9438	2.9324			
3.4281	3.4122	3.3969	3.3823	3.3682	3.3547	3.3418			
3.8469	3.8290	3.8119	3.7955	3.7797	3.7646	3.7500			
4.2647	4.2449	4.2259	4.2077	4.1902	4.1734	4.1573	4.1417	4.1267	4.1122
4.6817	4.6598	4.6390	4.6190	4.5999	4.5814	4.5637	4.5466	4.5302	4.5142
5.0978	5.0740	5.0513	5.0296	5.0087	4.9886	4.9693	4.9507	4.9328	4.9155
5.5131	5.4874	5.4629	5.4394	5.4168	5.3951	5.3742	5.3541	5.3347	5.3160
5.9278	5.9002	5.8738	5.8485	5.8242	5.8009	5.7784	5.7568	5.7360	5.7158
6.3418	6.3123	6.2840	6.2570	6.2310	6.2061	6.1821	6.1589	6.1366	6.1150
6.7553	6.7238	6.6937	6.6649	6.6372	6.6107	6.5851	6.5604	6.5367	6.5137
7.1682	*7.1348*	*7.1029*	7.0723	7.0429	7.0147	6.9876	6.9614	6.9362	6.9118
7.5805	*7.5452*	*7.5115*	*7.4791*	*7.4481*	7.4183	*7.3896*	7.3619	7.3352	7.3085
7.9924	*7.9552*	*7.9196*	*7.8855*	*7.8528*	*7.8213*	*7.7911*	7.7619	*7.7338*	7.7066
8.4038	*8.3647*	*8.3273*	*8.2914*	*8.2570*	*8.2239*	*8.1921*	*8.1615*	*8.1319*	*8.1033*
8.8148	*8.7738*	*8.7345*	*8.6969*	*8.6608*	*8.6261*	*8.5928*	*8.5606*	*8.5296*	*8.4996*
9.2254	*9.1824*	*9.1413*	*9.1020*	*9.0642*	*9.0279*	*8.9930*	*8.9593*	*8.9268*	*8.8955*
9.6355	*9.5907*	*9.5478*	*9.5066*	*9.4672*	*9.4293*	*9.3928*	*9.3576*	*9.3237*	*9.2910*
10.0453	*9.9985*	*9.9538*	*9.9109*	*9.8698*	*9.8303*	*9.7923*	*9.7556*	*9.7203*	*9.6861*
10.4547	*10.4061*	*10.3595*	*10.3149*	*10.2721*	*10.2309*	*10.1914*	*10.1532*	*10.1164*	*10.0809*
10.8638	*10.8132*	*10.7648*	*10.7185*	*10.6740*	*10.6312*	*10.5901*	*10.5505*	*10.5122*	*10.4753*
11.2725	*11.2200*	*11.1698*	*11.1217*	*11.0756*	*11.0312*	*10.9885*	*10.9474*	*10.9077*	*10.8694*
11.6809	*11.6265*	*11.5745*	*11.5247*	*11.4768*	*14.4309*	*11.3867*	*11.3440*	*11.3029*	*11.2632*
12.0890	*12.0327*	*11.9789*	11.9273	*11.8778*	*11.8302*	*11.7845*	*11.7404*	*11.6978*	*11.6567*
12.4968	*12.4386*	*12.3830*	12.3296	*12.2785*	*12.2293*	*12.1820*	*12.1364*	*12.0924*	*12.0499*
12.9043	*12.8442*	*12.7867*	12.7317	*12.6788*	12.6281	12.5792	*12.5321*	12.4867	12.4429
13.3115	*13.2495*	13.1903	13.1335	13.0789	13.0266	12.9762	*12.9276*	12.8808	12.8355
13.7185	*13.6546*	13.5935	13.5350	13.4786	13.4248	13.3729	*13.3228*	13.2745	13.2279
14.1252	14.0594	13.9965	13.9362	13.8784	13.8228	13.7693	*13.7178*	13.6681	13.6201
14.5316	14.4639	14.3992	14.3372	14.2777	14.2205	14.1655	*14.1125*	14.0613	14.0119
14.9378	14.8682	14.8017	14.7379	14.6768	14.6180	14.5614	14.5069	14.4544	14.4036
15.3437	15.2722	15.2039	15.1384	15.0756	15.0152	14.9571	14.9012	14.8472	14.7950
15.7494	15.6760	15.6059	15.5387	15.4742	15.4122	15.3526	15.2952	15.2397	15.1862
16.1549	16.0796	16.0077	15.9387	15.8726	15.8090	15.7479	15.6889	15.6321	15.5772
16.5601	16.4830	16.4092	16.3386	16.2708	16.2056	16.1429	16.0825	16.0242	15.9679

Table 11-iii. (つづき)

H \ D	68	70	72	74	76	78	80	82	84
2									
3									
4									
5									
6									
7									
8									
9									
10	4.0982	4.0847	4.0715	4.0588	4.0464	4.0344	4.0228	4.0114	4.0004
11	4.4989	4.4840	4.4695	4.4556	4.4420	4.4288	4.4160	4.4036	4.3915
12	4.8987	4.8825	4.8668	4.8516	4.8368	4.8225	4.8085	4.7950	4.7818
13	5.2978	5.2803	5.2633	5.2469	5.2309	5.2154	5.2003	5.1856	5.1714
14	5.6963	5.6775	5.6592	5.6415	5.6243	5.6077	5.5915	5.5757	5.5603
15	6.0942	6.0740	6.0545	6.0356	6.0172	5.9993	5.9820	5.9651	5.9487
16	6.4915	6.4700	6.4492	6.4290	6.4095	6.3905	6.3720	6.3540	6.3365
17	6.8883	6.8655	6.8434	6.8220	6.8012	6.7811	6.7615	6.7424	6.7238
18	7.2846	7.2604	7.2371	7.2145	7.1925	7.1712	7.1504	7.1303	7.1107
19	7.6804	*7.6549*	7.6303	7.6065	7.5833	7.5608	7.5389	7.5177	7.4970
20	*8.0757*	*8.0490*	*8.0231*	7.9980	7.9737	*7.9500*	7.9270	7.9047	7.8829
21	*8.4706*	*8.4426*	*8.4155*	8.3891	8.3636	*8.3388*	*8.3147*	8.2912	8.2684
22	*8.8652*	*8.8358*	*8.8074*	8.7799	8.7531	*8.7272*	*8.7020*	8.6774	*8.6535*
23	*9.2593*	*9.2287*	*9.1990*	*9.1702*	*9.1423*	*9.1152*	*9.0888*	9.0632	*9.0383*
24	*9.6531*	*9.6212*	*9.5902*	*9.5602*	*9.5311*	*9.5028*	*9.4754*	*9.4487*	*9.4227*
25	*10.0465*	*10.0133*	*9.9811*	*9.9499*	*9.9196*	*9.8901*	*9.8616*	*9.8338*	*9.8067*
26	*10.4396*	*10.4051*	*10.3716*	*10.3392*	*10.3077*	*10.2771*	*10.2474*	*10.2185*	*10.1904*
27	*10.8324*	*10.7965*	*10.7618*	*10.7282*	*10.6955*	*10.6638*	*10.6329*	*10.6030*	*10.5738*
28	*11.2249*	*11.1877*	*11.1517*	*11.1168*	*11.0830*	*11.0501*	*11.0182*	10.9871	10.9569
29	*11.6770*	11.5786	*11.5413*	*11.5052*	*11.4702*	*11.4362*	*11.4031*	11.3710	11.3397
30	*12.0089*	11.9691	*11.9306*	*11.8933*	*11.8571*	*11.8219*	*11.7878*	11.7545	11.7222
31	*12.4005*	12.3594	12.3197	*12.2811*	*12.2437*	*12.2074*	*12.1721*	12.1378	12.1044
32	*12.7918*	12.7495	12.7084	12.6687	*12.6301*	*12.5927*	12.5563	12.5209	12.4864
33	13.1828	13.1392	13.0970	13.0560	13.0162	*12.9776*	12.9401	12.9036	12.8681
34	13.5736	13.5287	13.4852	13.4430	13.4021	*13.3623*	13.3237	13.2862	13.2496
35	13.9642	13.9180	13.8732	13.8298	13.7877	*13.7468*	13.7071	13.6684	13.6308
36	14.3545	14.3070	14.2610	14.2164	14.1731	14.1311	14.0902	14.0505	14.0118
37	14.7446	14.6958	14.6485	14.6027	14.5583	14.5151	14.4731	14.4323	14.3926
38	15.1345	15.0844	15.0359	14.9888	14.9432	14.8989	14.8558	14.8139	14.7732
39	15.5241	15.4727	15.4230	15.3747	15.3279	15.2824	15.2383	15.1953	15.1535
40	15.9135	15.8609	15.8099	15.7604	15.7124	15.6658	15.6205	15.5765	15.5336

86	88	90	92	94	96	98	100	102	104
3.9896	3.9792	3.9690	3.9590	3.9493	3.9398	3.9305	3.9214	3.9126	
4.3797	4.3682	4.3569	4.3460	4.3353	4.3249	4.3147	4.3048	4.2950	
4.7689	4.7564	4.7442	4.7323	4.7207	4.7093	4.6982	4.6874	4.6768	
5.1575	5.1439	5.1307	5.1179	5.1053	5.0930	5.0810	5.0693	5.0578	
5.5454	5.5308	5.5166	5.5028	5.4893	5.4761	5.4632	5.4506	5.4383	
5.9327	5.9172	5.9020	5.8872	5.8727	5.8586	5.8448	5.8313	5.8181	5.8052
6.3195	6.3029	6.2867	6.2710	6.2556	6.2405	6.2258	6.2115	6.1974	6.1837
6.7058	6.6882	6.6710	6.6543	6.6379	6.6220	6.6064	6.5911	6.5762	6.5616
7.0915	7.0729	7.0548	7.0371	7.0198	7.0029	6.9864	6.9703	6.9545	6.9391
7.4769	7.4572	7.4381	7.4194	7.4012	7.3834	7.3660	7.3490	7.3324	7.3161
7.8617	7.8411	7.8210	7.8013	7.7822	7.7635	7.7452	7.7273	7.7098	7.6927
8.2462	*8.2246*	8.2035	8.1829	8.1628	8.1431	8.1240	8.1052	8.0869	8.0689
8.6303	*8.6076*	8.5855	8.5640	8.5430	8.5224	8.5023	8.4827	8.4635	8.4448
9.0140	*8.9903*	8.9673	*8.9447*	8.9228	8.9013	8.8804	8.8599	8.8398	8.8202
9.3973	*9.3727*	*9.3486*	9.3251	9.3022	9.2799	9.2580	9.2367	9.2158	9.1953
9.7803	*9.7547*	*9.7296*	9.7052	9.6814	9.6581	9.6353	9.6131	9.5914	9.5701
10.1630	*10.1363*	*10.1103*	10.0849	10.0602	10.0360	10.0124	9.9892	9.9667	9.9445
10.5454	*10.5177*	*10.4907*	10.4644	10.4387	10.4136	10.3890	10.3651	10.3416	10.3187
10.9274	*10.8988*	*10.8708*	10.8435	10.8169	10.7909	10.7654	10.7406	10.7163	10.6925
11.3092	*11.2795*	11.2506	11.2223	11.1948	11.1678	11.1415	11.1158	11.0907	11.0661
11.6907	11.6600	11.6301	11.6009	11.5724	11.5446	11.5174	11.4908	11.4648	11.4394
12.0719	12.0402	12.0093	11.9792	11.9497	11.9210	11.8929	11.8655	11.8387	11.8124
12.4529	12.4202	12.3883	12.3572	12.3268	*12.2972*	12.2682	12.2399	12.2122	12.1852
12.8335	12.7999	12.7670	12.7350	12.7037	12.6731	12.6433	12.6141	12.5856	12.5577
13.2140	13.1793	13.1455	13.1125	13.0803	13.0488	13.0181	12.9881	12.9587	12.9299
13.5942	13.5585	13.5237	13.4898	13.4566	13.4243	13.3927	13.3618	13.3315	13.3020
13.9742	13.9375	13.9017	13.8668	13.8328	13.7995	13.7670	13.7352	13.7042	13.6738
14.3539	14.3162	14.2795	14.2437	14.2087	14.1745	14.1411	14.1085	14.0766	14.0454
14.7335	14.6948	14.6571	14.6203	14.5844	14.5493	14.5150	14.4815	14.4488	14.4167
15.1128	15.0731	15.0344	14.9967	14.9598	14.9239	14.8887	14.8544	14.8208	14.7879
15.4919	15.4512	15.4116	15.3729	15.3351	15.2982	15.2622	15.2270	15.1926	15.1589

Table 11-iii. (つづき)

H \ D	106	108	110	112	114	116	118	120	122
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15	5.7926	5.7802	5.7681						
16	6.1702	6.1570	6.1441						
17	6.5473	6.5334	6.5197						
18	6.9240	6.9092	6.8947						
19	7.3002	7.2846	7.2694						
20	7.6760	7.6596	7.6436						
21	8.0514	8.0342	8.0174						
22	8.4264	8.4084	8.3908						
23	8.8010	8.7822	8.7638						
24	9.1753	9.1557	9.1365						
25	9.5493	9.5289	9.5089						
26	9.9229	9.9017	9.8810						
27	10.2962	10.2743	10.2527						
28	10.6693	10.6465	10.6242						
29	11.0420	11.0184	10.9953						
30	11.4145	11.3901	11.3662						
31	11.7867	11.7615	11.7369						
32	12.1586	12.1327	12.1073						
33	12.5303	12.5036	12.4774						
34	12.9018	12.8743	12.8473						
35	13.2730	13.2447	13.2169						
36	13.6440	13.6149	13.5864						
37	14.0148	13.9849	13.9556						
38	14.3854	14.3547	14.3246						
39	14.7557	14.7242	14.6934						
40	15.1259	15.0936	15.0619						

A Study on the Method of Preparation of Form Basal Area and Form Height Tables

Miyoko HIWATASHI

Summary

Plotless sampling is being increasingly used in forest surveys because of its simplicity and quickness, and many articles have been published about this method. It is necessary to use the form height (*fh*) of each single tree in the point sampling method (BITTERLICH's method), and the form basal area (*fg*) of each single tree in the line sampling method (L1 method which is an improved STRAND's method) for estimating the volume per hectare in a stand. Therefore, *fh* and *fg* tables of Sugi (*Cryptomeria japonica* D. DON), Hinoki (*Chamaecyparis obtusa* SIEB. et ZUCC.), Akamatsu (*Pinus densiflora* SEIB. et ZUCC.) and broad-leaved tree in the regions of Tokyo and Maebashi Regional Forest Office have been prepared.

About 500 sample trees selected from the data, which had been collected for the preparation of tree-volume tables were used. The preparation methods are as follows:

In the preparation of *fg* tables, empirical equations $fg=aD^b$ and $fg=aD^bH^c$ were used, and in the preparation of *fh* tables, $fh=aH^b$ and $fh=aH^bD^c$ were used, where D is the diameter at breast height in cm and H is the whole tree height in m. These equations were transformed into linear equations by the logarithmic transformation, and regression coefficients and constants were determined by the least squares method.

The results of this calculation are shown in Table 1. Two different kinds of equations were used for the preparation of each table. Testing *fg* equations, we could not find any significant gain due to adding H. Estimated equations are shown in Table 3. Estimated values of *fg* and *fh* calculated from these equations are shown in Table 4-i～Table 11-iii.

These calculations were carried out by the electronic computers NEAC 1240 and TOSBAC 3400.

〔付　録〕

この計算が終了してしばらく経ってから，大友栄松（経営部第二科長）は，Hanspeter Thöni が A Table for Estimating the Mean of a Lognormal Distribution という論文（Journal of the American Statistical Association, **64**, 326, 632～636 (1964)）の中で修正係数について述べているのを見い出した。詳しいことは後日，大友によって紹介されるはずである。ここでは，結果が今までとどの程度異なるかを，若干，テストしたので付記するにとどめる。修正係数を実際に計算するのに，従来は前記のとおり，対数による誤差分散 s^2 を 1.151293倍して真数にもどして求めた。新しい方法では，

$$1+\frac{n-1}{n}\left(\frac{1}{2}(\log_e 10)^2 s^2\right)+\frac{(n-1)^3}{n^2(n+1)2!}\left(\frac{1}{2}(\log_e 10)^2 s^2\right)^2$$

$$+\frac{(n-1)^5}{n^3(n+1)(n+3)3!}\left(\frac{1}{2}(\log_e 10)^2 s^2\right)^3+\cdots\cdots$$

を求めて，この値を対数変換したのを用いる。今までの方法は，この新しい方法よりも過大な推定値となると著者は書いている[3]。

東京スギについて，第2項以降のオーダを計算すると

第2項　0.002190

第3項　0.000000005007

となり，第3項以降は無視してよいことがわかる。そこで2項目までをとって計算した修正係数を従来の方法と比べると（FG について）

	東京スギ	東京アカマツ	前橋アカマツ
従来の方法	0.000951	0.002400	0.004096
新しい方法	0.000950	0.002394	0.004077

となる。これを用いて，直径の小中大として，D=6, 30, 80cm をえらび，両方法の比較を行なったが，推定値では，小数点以下4桁までは同じであった。

ここで計算された程度の標準誤差では，推定値への影響は少ないが，標準誤差が大きくなると異なると考えられるので，注意が必要である。

推定式と各統計量を求めるプログラム

```
TOSBAC 3400      TOPS-3  FORTRAN                                06/04/69    PAGE  1

           COMMON N,D,H,V
           DIMENSION NN(500),D(500),H(500),V(500),V1(500)
      C    CALCULATION  OF  FG=A+BD, FG=A+BD+CH, FH=A+BH  AND  FH=A+BH+CD
           WRITE(6,1000)
      1000 FORMAT(1H1,28HCALCULATION  OF  FG  AND  FH,////)
         1 READ(5,100)
       100 FORMAT(55H
           WRITE(6,100)
           READ(5,101) N,(NN(I),D(I),H(I),V(I),V1(I),I=1,N)
       101 FORMAT(I10,/(I10,4F10.0))
      C    PRINT  OF  INPUT  DATA
           WRITE(6,1001)
      1001 FORMAT(1H0,///,11HINPUT  DATA,//,1H0,12X,3HNO.,8X,1HD,9X,1HH,7X,2H
          1FG,10X,2HFH,///)
           DO 2 I=1,N
           WRITE(6,1002) NN(I),D(I),H(I),V(I),V1(I)
      1002 FORMAT(1H ,I15,2F10.1,F11.5,F11.3)
         2 CONTINUE
           CONST=0.43429448
           DO 3 I=1,N
           D(I)=CONST*ALOG(D(I))
           H(I)=CONST*ALOG(H(I))
           V(I)=CONST*ALOG(V(I))
           V1(I)=CONST*ALOG(V1(I))
         3 CONTINUE
           CALL LINEAR
           READ(5,100)
           WRITE(6,100)
           CALL DOUBLE
           DO 4 I=1,N
           Z=D(I)
           D(I)=H(I)
           H(I)=Z
           V(I)=V1(I)
         4 CONTINUE
           READ(5,100)
           WRITE(6,100)
           CALL LINEAR
           READ(5,100)
           WRITE(6,100)
           CALL DOUBLE
           GO TO 1
           END
```

```
*TFTC    SUB1

      TOSBAC 3400      TOPS-3  FORTRAN                                06/04/69     PAGE   3

      SUBROUTINE LINEAR
      COMMON N,D,H,V
      DIMENSION D(500),H(500),V(500)
C     CALCULALION  OF  LINEAR  REGRESSION
      FN=N
      SD=0.0
      SV=0.0
      SDD=0.0
      SVV=0.0
      SDV=0.0
      DO 1 I=1,N
      SD=SD+D(I)
      SV=SV+V(I)
      SDD=SDD+D(I)**2
      SVV=SVV+V(I)**2
      SDV=SDV+D(I)*V(I)
    1 CONTINUE
      SSX=SDD-SD**2/FN
      SSY=SVV-SV**2/FN
      SSXY=SDV-SD*SV/FN
      XMEAN=SD/FN
      YMEAN=SV/FN
      B=SSXY/SSX
      A=YMEAN-B*XMEAN
      NDF=FN-2.0
      SYHAT=B*SSXY
      SDYX=SSY-SYHAT
      SYX2=SDYX/FLOAT(NDF)
      NDF1=N-1
      R=SQRT(SYHAT/SSY)
      F=SYHAT/SYX2
      WRITE(6,10) N,SD,SV,XMEAN,YMEAN,SDD,SVV,SDV,SSX,SSY,SSXY
   10 FORMAT(1H1,5X,18HLINEAR  REGRESSION,/////,5X,2HN=,I6,////,18X,1HX,
     115X,1HY,///,5X,3HSUM,2F16.6,///,5X,4HMEAN,F15.6,F16.6,/////,5X,32HS
     2UMS  OF  SQUARES  AND  PRODUCTS,///,26X,1HX,15X,1HY,15X,2HXY,///,5
     3X,11HUNCORRECTED,3F16.6,///,5X,9HCORRECTED,2X,3F16.6)
      WRITE(6,11) A,B,R
   11 FORMAT(1H0,/5X,8HEQUATION,///,9X,3HY =,F16.6,3H  +,F16.6,3H  X,///
     1/,5X,24HCORRELATION  COEFFICIENT,///,9X,3HR =,F10.8)
      WRITE(6,12) NDF1,SSY,SYHAT,SYHAT,F,NDF,SDYX,SYX2
   12 FORMAT(1H0,//5X,29HANALYSIS  OF  VARIANCE  TABLE,///,22X,4HD.F.,8X
     1,4HS.S.,12X,4HM.S.,8X,1HF,///,6X,5HTOTAL,I15, F16.6,/// 6X,10HREGR
     2ESSION,9X,1H1,2F16.6,F14.4,///,6X,8HRESIDUAL,I12,2F16.6,//,1H1)
      RETURN
      END
```

```
      SUBROUTINE DOUBLE
      COMMON N,D,H,V
      DIMENSION D(500),H(500),V(500)
C     CALCULATION  OF  DOUBLE  REGRESSION
      FN=N
      NDF1=N-1
      NDF2=N-3
      SD=0.0
      SH=0.0
      SV=0.0
      SDD=0.0
      SHH=0.0
      SVV=0.0
      SDH=0.0
      SDV=0.0
      SHV=0.0
      DO 1 I=1,N
      SD=SD+D(I)
      SH=SH+H(I)
      SV=SV+V(I)
      SDD=SDD+D(I)**2
      SHH=SHH+H(I)**2
      SVV=SVV+V(I)**2
      SDH=SDH+D(I)*H(I)
      SDV=SDV+D(I)*V(I)
      SHV=SHV+H(I)*V(I)
    1 CONTINUE
      X1M=SD/FN
      X2M=SH/FN
      YM=SV/FN
      SSX1=SDD-SD**2/FN
      SSX2=SHH-SH**2/FN
      SSY=SVV-SV**2/FN
      SSX12=SDH-SD*SH/FN
      SSX1Y=SDV-SD*SV/FN
      SSX2Y=SHV-SH*SV/FN
      DET=SSX1*SSX2-SSX12**2
      B=(SSX2*SSX1Y-SSX12*SSX2Y)/DET
      C=(SSX1*SSX2Y-SSX12*SSX1Y)/DET
      A=YM-B*X1M-C*X2M
      SYHAT=B*SSX1Y+C*SSX2Y
      SDY12=SSY-SYHAT
      SY12=SDY12/FLOAT(NDF2)
      SYHATM=SYHAT/2.0
      R=SQRT(SYHAT/SSY)
      F=SYHATM/SY12
```

```
46          WRITE(6,100) N,SD,SH,SV,X1M,X2M,YM
47      100 FORMAT(1H0,///,5X,3HN =,I6,////,18X,2HX1,14X,2HX2,15X,1HY, ///,5X,
47         13HSUM,3F16.6,///,5X,4HMEAN,F15.6,2F16.6,//)
48          WRITE(6,101) SDD,SDH,SDV,SHH,SHV,SVV
49      101 FORMAT(1H0,//,5X,32HSUMS OF SQUARES AND PRODUCTS,////,23X,2HX1
49         1,14X,2HX2,15X,1HY,///,10X,2HX1,4X,3F16.6,///,10X,2HX2,20X,2F16.6,/
49         2//,10X,1HY,37X,F16.6)
50          WRITE(6,102) SSX1,SSX12,SSX1Y,SSX2,SSX2Y,SSY,A,B,C,R
51      102 FORMAT(1H0,//,5X,43HCORRECTED SUMS OF SQUARES AND PRODUCTS,//
51         1//,23X,2HX1,14X,2HX2,15X,1HY,///,10X,2HX1,4X,3F16.6,///,10X,2HX2,2
51         20X,2F16.6,///,10X,1HY,37X,F16.6,//////,5X,20HREGRESSION EQUATION,
51         3///,9X,3HY =,F16.6,2H +,F16.6,3H X1,2H +,F16.6,3H X2,//////,5X,26H
51         4CORRELATION COEFFICIENT ,///,9X,3HR= ,F10.8)
52          TB=B/SQRT(SY12*SSX2/DET)
53          TC=C/SQRT(SY12*SSX1/DET)
54          WRITE(6,103) TB,TC
55      103 FORMAT(1H0,//,5X,54HTESTS OF SIGNIFICANCE OF REGRESSION COEFF
55         1ICIENT ,///,9X,4HTB =,F10.4,///,9X,4HTC =,F10.4)
56          WRITE(6,104) NDF1,SSY,SYHAT,SYHATM,F,NDF2,SDY12,SY12
57      104 FORMAT(1H0,///,5X,29HANALYSIS OF VARIANCE TABLE,///,22X,4HD.F.,
57         18X,4HS.S.,12X,4HM.S.,9X,1HF,///,6X,5HTOTAL,I15,F16.6,///,6X,10HREG
57         2RESSION,9X,1H2,2F16.6,F14.4,///,6X,8HRESIDUAL,I12,2F16.6,//,1H1)
58          RETURN
59          END
```

推定値計算のプログラム

```
     TOSBAC 3400      TOPS-3   FORTRAN                          06/26/69    PAGE   1

     C     CALCULATION OF ESTIMATES
1          COMMON A,B,C,ND,NH
2          WRITE(6,100)
3      100 FORMAT(1H1,45HCALCULATION FOR ESTIMATION OF FG AND FH)
4          READ(5,50) ND,NH
5       50 FORMAT(2I10)
6        1 READ(5,51)
7          WRITE(6,53)
8       53 FORMAT(1H1)
9       51 FORMAT(70H
9         1                  )
10         WRITE(6,51)
11         READ(5,52) A,B,C
12      52 FORMAT(3F10.6)
13         IC=C*1000000.0
14         IF(IC-0)3,2,3
15       2 CALL LINEAR
16         GO TO 4
17       3 CALL DOUBLE
18       4 GO TO 1
19         END
```

```
*TFTC    SUB1
         TOSBAC 3400       TOPS-3   FORTRAN                                    06/23/69     PAGE    3

  1             SUBROUTINE  LINEAR
  2             COMMON  A,B,C,ND,NH
  3             WRITE( 6, 100)  A, B
  4         100 FORMAT(1H0,/5X,3HA =,F10.6,//,5X,3HB =,F10.6,////,11X,1HX,9X,5HLOG
  4            1 Y,7X,11HESTIMATED Y,//)
  5             DO 1 I=2,ND
  6             FI=I
  7             BX=0.434294482*ALOG(FI)
  8             Y=A+B*BX
  9             ESTY=2.302585093*Y
 10             ESTY=EXP(ESTY)
 11             WRITE(6,101) I,Y,ESTY
 12         101 FORMAT(1H ,5X,I7,F15.7,F15.5)
 13           1 CONTINUE
 14             RETURN
 15             END

*TFTC    SUB2
         TOSBAC 3400       TOPS-3   FORTRAN                                    06/23/69     PAGE    5

  1             SUBROUTINE DOUBLE
  2             COMMON A,B,C,ND,NH
  3             WRITE(6,100) A,B,C
  4         100 FORMAT(1H0,//,5X,3HA =,F10.6,//,5X,3HB =,F10.6,//,5X,3HC =,F10.6)
  5             T=0.434294482
  6             DO 2 J=2,NH
  7             FJ=J
  8             BH=T*ALOG(FJ)
  9             WRITE(6,101) J
 10         101 FORMAT(1H0,/,5X,3HH =,I6,///,11X,1HD,9X,5HLOG Y,7X,11HESTIMATED Y,
 10            1//)
 11             DO 1 I=2,ND,2
 12             FI=I
 13             CD=T*ALOG(FI)
 14             Y=A+B*BH+C*CD
 15             ESTY=2.302585093*Y
 16             ESTY=EXP(ESTY)
 17             WRITE(6,102) I,Y,ESTY
 18         102 FORMAT(1H ,5X,I7,F15.7,F15.5)
 19           1 CONTINUE
 20           2 CONTINUE
 21             RETURN
 22             END
```