PROVINCE OF BRITISH COLUMBIA

DEPARTMENT OF LANDS, FORESTS, AND WATER RESOURCES

HON. R. G. WILLISTON, *Minister* D. BORTHWICK, *Deputy Minister of Lands*

REPORT

of the

LANDS SERVICE

YEAR ENDED DECEMBER 31

1970

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in right of the Province of British Columbia.
1971

VICTORIA, BRITISH COLUMBIA, February 16, 1971.

To the Honourable JOHN R. NICHOLSON, P.C., O.B.E., Q.C., LL.D.,
Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

Herewith I beg respectfully to submit the Annual Report of the British Columbia Lands Service of the Department of Lands, Forests, and Water Resources for the year ended December 31, 1970.

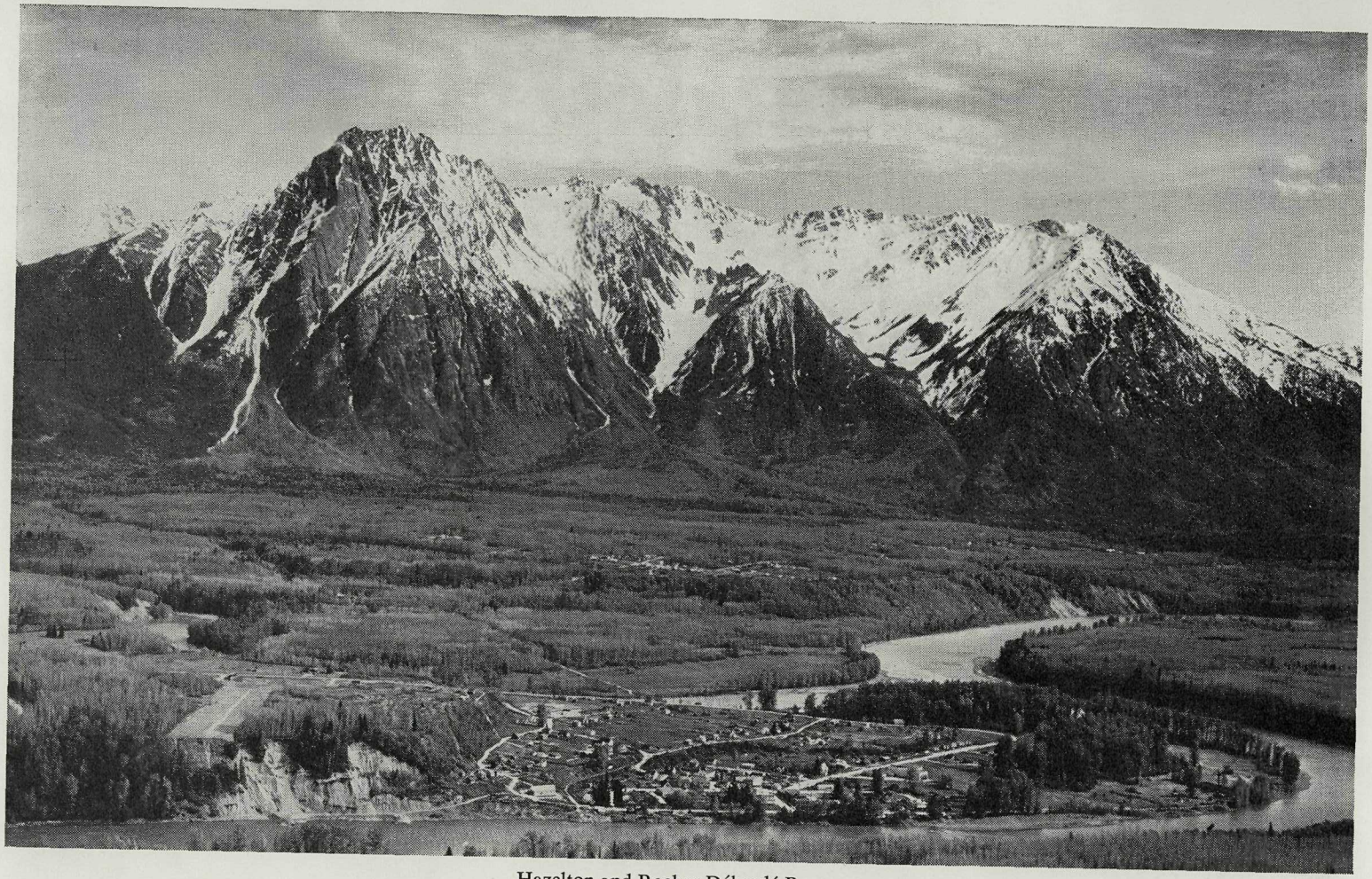
R. G. WILLISTON
Minister of Lands, Forests, and Water Resources

VICTORIA, BRITISH COLUMBIA, February 16, 1971.

The Honourable R. G. Williston,
Minister of Lands, Forests, and Water Resources,
Victoria, British Columbia.

SIR: I have the honour to submit the Annual Report of the British Columbia Lands Service of the Department of Lands, Forests, and Water Resources for the 12 months ended December 31, 1970.

D. BORTHWICK
Deputy Minister of Lands



Hazelton and Rocher Déboulé Range.

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COVER PHOTO
South Thompson Valley, near Kamloops.

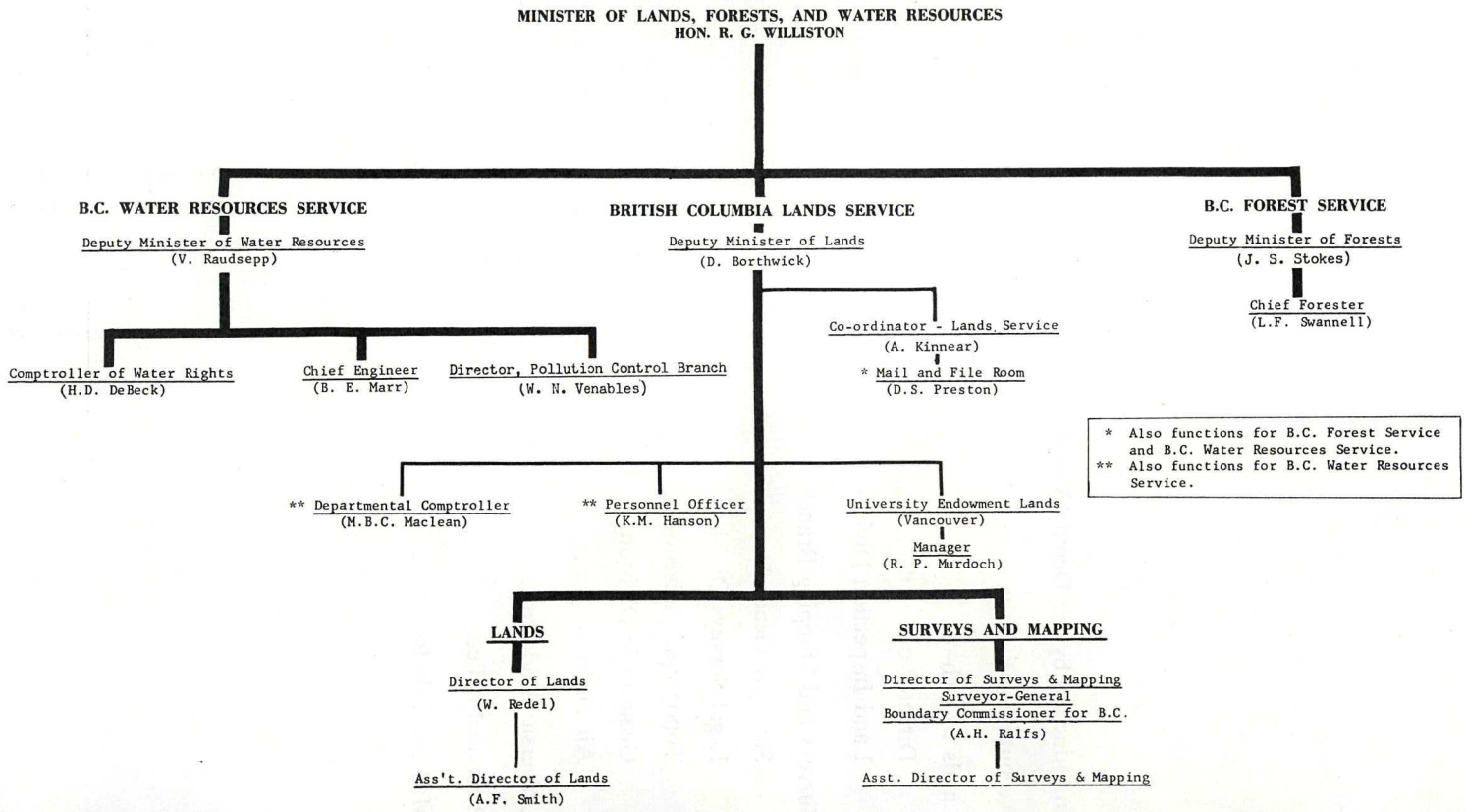
ORGANIZATION

BRITISH COLUMBIA LANDS SERVICE

DEPARTMENT OF LANDS, FORESTS, AND WATER RESOURCES

Victoria, B.C.

Year ending December 31, 1970.



* Also functions for B.C. Forest Service and B.C. Water Resources Service.

** Also functions for B.C. Water Resources Service.

Report of the British Columbia Lands Service

D. Borthwick, B.S.A., B.Ed., A.A.C.I., Deputy Minister of Lands

The outstanding event of significance to the Lands Service during 1970 was legislative approval and proclamation of the new *Land Act*. While retaining the basic elements of its predecessors, the 1970 statute streamlines or eliminates several outmoded procedures, corrects deficiencies, and strengthens the comprehensive management of Provincial Crown lands.

Especially noteworthy in the 1970 *Land Act* is elimination of pre-emption as a mode of land disposition. The pre-emption system was introduced in 1860 and during its 110-year history it served as the vehicle by which thousands of rural settlers established roots throughout the Province. Changing social and economic conditions and increasing complexities of land use eventually brought the pre-emption system to the brink of obsolescence. In recent years there had been a sharp decline in allowable pre-emption applications, nearly all of which were confined to the Peace River region of the Province.

Another significant element of the new *Land Act* is limitation of the right to purchase land leading to Crown grant and title to Canadian citizens, whether corporate or individual.

Several procedural changes have been introduced. These include provision for the Minister to require, at his discretion, advertisement of an application for disposition of either surveyed or unsurveyed land, posting of a performance bond as evidence of financial security, and personal occupation and residence on the land by the applicant for a specified period of time.

Coincident with changes in the general disposition sections of the Act was a substantial revision of the survey sections. The Surveyor-General is empowered by section 64 of the Act to make regulations which are considered necessary for carrying out surveys of Crown land. The *General Survey Instructions to British Columbia Land Surveyors* was extensively revised and reprinted.

Reflecting the slower pace of the Provincial economic expansion, net revenues declined in 1970. Although income from leases, rentals, and fees came close to being sustained at last year's level, revenue from land sales fell sharply. Consistent application of the lease-to-purchase principle rather than economic factors was chiefly responsible for the decline in land-sales revenue, however.

Early in the year a moratorium was placed on applications for Crown land for agricultural purposes in north central British Columbia. This region, which is still in an early stage of agricultural development, needs further study to determine the viability of farming as a resource use. The moratorium does not apply to established farmers who may round out their existing freehold units by applying for additional arable Crown land.

The Surveys and Mapping Branch maintained its steady production of maps, aerial photographs, and topographical and cadastral surveys. All divisions of the Branch expanded coverage of the northern half of the Province. Thirty-five field projects were successfully completed in 1970 north of the 54 parallel of latitude.

The integrated surveys programme continues to flourish. During the year another integrated survey area was declared and gazetted under authority of the *Official Surveys Act Amendment Act, 1964*. Activities ranging from preliminary feasibility studies to final network computation and plan preparation are under way in several other areas.

Map and air-photo distribution established new records during 1970, and revenues from these sources increased by 7.5 per cent over 1969.

Detailed reports of the various units of the Lands Service follow. Indexes showing cartographic and air-photo coverage are inside the envelope attached to the back cover of this Report.

ACCOUNTING DIVISION

ACCOUNTING DIVISION

M. B. MACLEAN, DEPARTMENTAL COMPTROLLER

The Accounting Division has again had an active year, and has managed to cope with an increasing work load through procedure adjustments and diligent contributions from staff members. On the other hand, we have been fortunate, except for periods of illness, in that we have been able to maintain full establishment throughout the year. The responsibility of this Division includes the accounting function for Water Resources Services as well as Lands Service, and includes the preparation of payrolls, vouchering of invoices and travel claims, billing of accounts receivable, expenditure and revenue control, and compilation of statistical information.

The steady growth in new leases has continued during 1970, with a net increase of 7½ per cent in lease accounts, from 13,050 at January 1, 1970 to 14,029 at December 31, 1970. Purchase accounts continued to decline from 483 at January 1, 1970 to 330 at December 31, 1970. The latter situation arises through the fact that the lease-to-purchase option very often results in a cash sale because of the need of the landowner to obtain a mortgage with the land title.

The Division had only two staff changes during the year, both were junior positions, and were filled without delay.

STATISTICAL TABLES

Table 1—Summary of Lands Service Net Revenue Collections for the Year Ended December 31, 1970

Land leases, rentals, fees, etc.	$2,283,719.11
Land sales	518,015.63
Sale of maps and air photos	223,265.50
Net revenue collections	$3,025,000.24

Table 2—Comparison of Revenue Collections for 10-year Period 1961–70, Inclusive

1961	$1,765,207.54
1962	1,847,457.83
1963	2,034,841.80
1964	2,587,110.34
1965	2,594,341.32[1]
1966	3,343,672.46[1]
1967	2,985,996.61[1]
1968	3,367,912.14[1]
1969	3,999,273.13[1]
1970	3,025,000.24[1]

[1] Net revenue.

Table 3—Classification of Revenue Collections for the Year Ended December 31, 1970

Land sales—			
Country lands		$393,641.23	
Town lots		125,899.53	
Surface rights, mineral claims		2,575.75	
			$522,116.51
Land leases, rentals, fees, etc.—			
Foreshore leases—			
Booming and log storage	$468,467.24		
Commercial (marina, etc.)	362,423.42		
Oyster	13,528.50		
Miscellaneous (foreshore protection, etc.)	912.35		
		$845,331.51	
Land leases—			
Grazing and (or) agriculture	$466,706.65		
Quarrying (limestone, sand and gravel)	39,025.38		
Camp-site (lodge, fishing)	7,536.70		
Home-site	2,108.53		
Residential	334,494.27		
Miscellaneous	60,140.15		
		910,011.68	
Land-use permits		2,710.00	
Licences of occupation		5,138.00	
Royalty collections		243,306.81	
Bonus bids (lease tenders and auctions)		105,265.39	
Easement collections—			
Annual rentals	$3,179.25		
Outright considerations	40,790.00		
		43,969.25	
Fees—			
Crown grant	$14,750.00		
Assignment	9,820.00		
Miscellaneous (lease, search, etc.)	16,657.00		
		41,227.00	
Sundry collections (occupational rental, survey charges, etc.)		92,579.51	
			2,289,539.15
Sale of maps and air photos—			
Legal Division		$38,158.62	
Geographic Division		106,218.76	
Air Division		110,708.05	
			255,085.43
Gross revenue for year			$3,066,741.09
Less refunds and taxes			41,740.85
Net revenue for year			$3,025,000.24

Table 4—Comparison of Land Leases, Rentals, Fees, Etc., Revenue for 10-year Period 1961–70, Inclusive

1961	$1,001,071.13
1962	933,607.66
1963	1,149,650.45
1964	1,485,539.13
1965	1,462,024.93[1]
1966	1,514,749.69[1]
1967	1,917,435.31[1]
1968	2,189,055.75[1]
1969	2,553,351.23[1]
1970	2,283,719.11[1]

[1] Net revenue.

Table 5—Comparison of Land Sales Revenue for 10-year Period 1961–70, Inclusive

1961	$703,705.71
1962	836,270.32
1963	787,184.11
1964	982,137.88
1965	1,017,893.16[1]
1966	1,692,861.14[1] [2]
1967	916,098.98[1] [2]
1968	1,024,410.93[1] [2]
1969	1,251,111.88[1] [2] [3]
1970	518,015.63[1]

[1] Net revenue.
[2] Includes sales to City of Prince George: 1966, $718,733; 1967, $107,200; 1968, $106,452; 1969, $156,240.
[3] Includes sale to City of Vancouver, False Creek area, $424,000.

LANDS BRANCH

THE LANDS BRANCH

At the time of the Fraser River gold-rush in 1858 the demand for land in British Columbia was greatly intensified and pre-emptions predated surveys. Within four years 254 pre-emptors had taken up more than 50,000 acres of land. To facilitate the transfer of real estate and provide for the registration of titles, the *Land Registry Act* was passed in 1860. The Government of the Province of British Columbia was now in the real-estate business in a big way; the more than 366,000 square miles of land and water that constitutes British Columbia was the real estate in question.

With the entrance of British Columbia into Confederation in 1871, the demand for land quickened to a rush, and over the next thirty years the land-settler (and the promoter) succeeded the gold-miner in importance. Railroads were built and land grants passed, cities came into being, and companies became established. Land was at the core of all developments.

The task of land administration became very heavy and necessitated the formation of a Department of Lands in 1908. In 1912 a Forest Branch was included in the Department of Lands. Today the Department of Lands, Forests, and Water Resources exercises control of more than 90 per cent of the surface of British Columbia.

How does the Lands Branch fit into the total organization of the British Columbia Lands Service of today? The relation may be expressed briefly. **The Lands Branch has jurisdiction in matters pertaining to the disposition of Crown land, and is charged with so administering and disposing of the land that the general welfare, present and future, of the Province must be protected at all times.**

When an individual, or group, desires to purchase or lease Crown land, the application is directed to the Director of Lands, head of the Lands Branch. His authority governs the following matters:—

- Sale, lease, and pre-emption of Crown lands for such purposes as agricultural, industrial, commercial, and home-sites.
- Preparation and issuance of Crown grants under the *Land Act* and the *Mineral Act.*
- Preparation and issuance of right-of-way easements for power, telephone, pipe lines, etc.
- Reservation of suitable Crown lands and foreshore for national defence, use and enjoyment of the public, forestry experimentation, fisheries research work, highways, etc.
- Granting railway rights-of-way under various Statutes.
- Protection of historic sites from alienation.
- Reservation and conveying of Crown lands for such purposes as school-sites, cemeteries, and fair grounds.
- Leasing of land and foreshore for such varied purposes as wharf-sites, booming-grounds, canneries, oyster and other mollusc fisheries, and for boat-houses, quarry-sites, cattle-ranching, trappers' cabins, ship-building, and aircraft bases.

To perform these and other functions efficiently, the Lands Branch works in close co-operation with a great number of other agencies, such as municipal and city administrations, town-planning authorities, the British Columbia Forest Service, the Water Resources Service, the Surveys and Mapping Branch within the British Columbia Lands Service, and all the departments in the Government of the Province, notably Highways, Education, Attorney-General, and Agriculture.

Outside the Provincial departments there is much business transacted with Federal departments, such as the Department of National Defence, the Veterans' Land Settlement Act administration, the Public Works Department, and the Indian Affairs Branch of the Department of Citizenship and Immigration.

Direct service to the people of British Columbia is the first duty of the Lands Branch and this takes the bulk of the time of the Lands Branch personnel. Associated with this prime duty is the important function of the maintenance of the records, which in many cases are the only ones in British Columbia showing the correct legal status of the surface of the Province.

—*Photo courtesy Cariboo Pulp and Paper Co.*

Cariboo Pulp and Paper Co. millsite near Quesnel. Clearing for mill in centre of photo.

Year ending December 31, 1970

LANDS BRANCH

DIRECTOR OF LANDS
(W. Redel)

ASSISTANT DIRECTOR OF LANDS
(A.F. Smith)

PROJECT OFFICER
(R. Rutherford)

ADMINISTRATIVE OFFICER
(G. A. Rhoades)

LAND ADMINISTRATION DIVISION

Administrative Officer
(W.J. Long)

SECTIONS

Purchases
(H.K. Kidd)

Leases
(W.C. Fry)

Crown Grants
(R. Wingfield-Digby)

Easements
(N.D. Smith)

Reserves
(C.W. House)

Clearances
(D. Conway)

Stenographer Pool
(Mrs. C. A. Greig)

LAND INSPECTION DIVISION

CHIEF LAND INSPECTOR
(L.D. Fraser)

ASST. CHIEF LAND INSPECTOR
(G.H. Wilson)

Land Inspection Districts

Burns Lake	-	T.J. Todd
Clinton	-	H. Wenschlag
Courtenay	-	D.E. Goodwin
Fort St. John	-	A.G. Anderson
Kamloops	-	D.I. Snider
Kelowna	-	G. Huva
Nelson	-	H.K. Boas
New Westminster	-	A. Paulsen
Pouce Coupe	-	R.W. Brown
Prince George	-	R.N. Bose
Prince Rupert	-	J. P. Egan
Quesnel	-	R.A. Cullis
Smithers	-	L.M. Warner
Vancouver	-	R.F. Gilmour
Vanderhoof	-	D.E. Jaffray
Victoria	-	J.A. Esler
Williams Lake	-	F.G. Edgell

LANDS BRANCH

WALTER R. REDEL, B.A.SC., P.ENG., P.AG., A.A.C.I., DIRECTOR OF LANDS

During 1970 there was a decrease of 16 per cent in the number of land applications filed with the Department. The over-all revenue of $2,811,655.66 was also a reduction from the revenue figure of 1969.

A highlight of the year occurred on May 1, 1970 when a Proclamation brought into effect the *Land Act,* 1970. This new Act, which is clearly written and more readily understood by the general public, is an advancement over the former Act. Following proclamation of the new Act, Departmental procedures were reviewed and policy is now being implemented through a series of policy memos which are proving to be of great benefit to staff and the general public alike.

Once again, the majority of the agricultural applications filed during the year were for lands in the Peace River and north central British Columbia areas, with the preponderance of applications being in the Peace River section. Activity in applications was somewhat slowed in north central British Columbia by a moratorium placed on agricultural applications at the beginning of the year, and now extended to December 1971. Provision has been made within the moratorium area to permit established farmers who have already developed their own fee lands to acquire Crown lands in order to round out and develop viable holdings. The moratorium was established as a result of concern with the increasing number of land applications and the extent of the areas applied for in a section of the Province still considered to be in a pioneer stage of development. A technical committee was set up by the Land Use Committee to study the whole question of the creation of new farm units in pioneer areas and the attendant problems of clearing extensive areas of raw lands of questionable fertility. As a part of the study, a resource atlas was prepared which should be of great assistance in ensuring that dispositions of Crown lands both inside and outside the Provincial forest are only made after cognizance has been taken of the potential of the other resources that may be affected.

Microwave communication in the Province continued to expand as the Pacific Great Eastern Railway Company, the Canadian National and Canadian Pacific Railways, British Columbia Hydro, and British Columbia Telephone Company all made additions to their existing systems. British Columbia Hydro and Power Authority has made significant additions to its power transmission and distribution facilities, including those formerly operated by the East Kootenay Power and Light Company. Three of the major gas and oil transmission companies initiated expansion programmes during 1970. To serve the needs of people and industry, one company, Westcoast Transmission Company Limited, has applied for a 24-inch gas pipe-line right-of-way from their Fort Nelson plant to the Beaver River gas field, a distance of 111.5 miles. This company has also applied for a right-of-way to increase pipe-line capacity by a loop line from the Peace River area to the Lower Mainland.

In addition to this type of industrial activity, numerous other applications have been processed on behalf of industry in order to permit development of gravel and limestone deposits, provide land for commercial use, mining plant sites, overburden and stockpile areas, and provide foreshore and land covered by water for booming, log storage, and deep-sea wharfage purposes.

To service and provide transport for existing and new industry, the Pacific Great Eastern Railway Company is extending its rail lines from Fort St. James to Dease Lake and from Fort St. John to Fort Nelson. The involvement of this

Department in assisting with railway development in the Province is to establish a reserve along a proposed route for initial line location and grant title to Crown lands for railway purposes once a final right-of-way location is selected and surveyed.

When required for municipal purposes, Crown lands are sold to municipalities throughout the Province for a nominal sum. By this means the Department was able to assist in the further development of three cities, two towns, eight villages, two municipalities, and three regional districts in 1970. The lands were required mainly for park, airport, and residential development purposes. In addition, the Department continued to co-operate with the school districts throughout the Province and during the year six free grants were made of Crown lands for school purposes.

Under certain circumstances the Department co-operates with municipalities in the acquisition of private lands required for municipal purposes where Crown lands of comparable value are available for exchange purposes. Both the private and Crown lands involved in any such proposal are appraised to determine market value. If the appraisal indicates the land values are equivalent, the Crown will then accept a conveyance of the privately owned land and subsequently issue a Crown grant under section 85 of the *Land Act* to the private owner. The lands conveyed to the Crown will then be granted to the municipality in order that such lands may be developed in the public interest.

Exchanges of this nature are also entered into on behalf of other Government departments. In this manner lands were acquired by the Parks Branch for public recreational use on Shawnigan Lake, Kennedy Lake, McLeod Lake, and on the Chilliwack River. In one case Surrey Municipality obtained land for park purposes at the same time the British Columbia Forest Service obtained a site for a nursery. In one other exchange, land was acquired by the regional district for an airport near Duncan.

The subdivision of Crown land continues to be an active function of the Lands Service. In keeping with a policy to discourage land sprawl throughout the Province, subdivision proposals are geared to public demand and developed with the concurrence of the respective regional district in which the Crown land being subdivided is situate. During 1970, 220 lots were created by Crown subdivision in various areas of the Province, including Courtenay, Quesnel, Nakusp, North Barriere Lake, Williams Lake, Young Lake, Chilliwack, and 100 Mile House. The planning of new subdivisions, with road construction being undertaken by the Department of Highways personnel and the legal surveys by the Surveys and Mapping Branch, has already started in the following areas: Fort St. James, Cranbrook, Green Lake, Parksville, Fort Nelson, Kootenay Lake, and Cumberland, and it is expected that lots within these new subdivisions will be available for public auction during 1971. With the ever-increasing demand for recreational summer-home site lots on Crown waterfront lands, the Department envisages a greater need for Crown subdivisions to be created on lakes suitable for this type of recreational activity.

Out of a total of 423 reserves established during the year, 119 were for the use, recreation, and enjoyment of the public. The remainder were established for various purposes on behalf of other departments of Government. Once again reserves were established for ecological sites, and the number of such reserves now totals 16 throughout the Province. As well, many map notations were recorded at the request of the Provincial Museum over archæological sites. The purpose of these reserves is to preserve and permit study by university and Government personnel of distinctive untouched ecological sites and to note the interest of the Provincial Museum staff in sites having archæological value. The archæological sites discov-

ered included pit-houses and rock-shelters, middens, pictograph and petroglyph panels, fish traps, and burial grounds.

For many years the Department has co-operated with and assisted the Federal Department of Transport, Marine Services, by making map notations on Departmental records of navigation-aid lights. The Department of Transport administers the *Navigable Waters Protection Act* and is responsible for the maintenance of navigation lights for mariners both on the Coast and on Interior lakes and, therefore, the recording of this information is important to the safety of navigation on waters within and on the Coast of the Province. Thirteen map notations were recorded during 1970.

A brief summary of the activities of the various sections of the Administration Division of the Lands Service is set out hereunder:

Leases Section—The number of new lease applications received decreased to 4,388 from 5,155 received in 1969. This decrease in numbers of applications can be attributed partially to the temporary moratorium established January 8, 1970 on Crown lands within the Land Recording Districts of Fort George, Fort Fraser, and Smithers with respect to agricultural lease applications. Also grazing of cattle in part of this area is now on a permit basis under the provisions of the *Forest Act,* whereas formerly leases were issued for grazing use. In addition, the establishment of a number of new Provincial forest reserves precludes alienation of Crown land under the *Land Act* within the reserve boundaries.

Purchase Section—Again purchase applications received have decreased in number to 150 from 290 received the previous year. This is not unexpected in view of the implementation of the lease-develop-purchase policy in 1965. In addition to the 150 applications to purchase, 217 lessees completed the necessary development requirements and were able to exercise purchase options leading to title.

Crown Grants Section—Applications for Crown grants in 1970 totalled 708 as compared to 931 in the previous year. The effect of the lease-develop-purchase policy is definitely reflected in this total. It is expected the number of applications for Crown grant will increase as lessees meet development requirements and convert their leases to a purchase and subsequently apply for Crown grant. This section also carries out clearances of reverted mineral claims, of which there were 672 in 1970.

Pre-emption and Reserve Section—When the Proclamation bringing into force the *Land Act,* 1970, was issued on May 1, 1970 the Department was no longer able to issue pre-emption records since the new Act contained no provision to do so. However, 22 applications on which the Department was committed prior to the Proclamation date were able to proceed. Reserve applications decreased from 562 in 1969 to 477 in 1970; 423 reserves were established during the year. Accretion applications handled by this section totalled 33 in 1970, up from 25 in 1969. Map notations made by this section on behalf of the Federal Department of Transport, Marine Services, totalled 13 in 1970. General inquiries regarding the availability of Crown land, also handled by this section, numbered 9,053, compared to 4,621 in 1969. General inquiries received in 1969 increased 26 per cent over those received in 1968; in 1970 the figure of 9,053 represents a 96-per-cent increase over the number of inquiries received in 1969!

Clearance Section—The number of clearances carried out by this section decreased from 18,133 in 1969 to 17,778 in 1970.

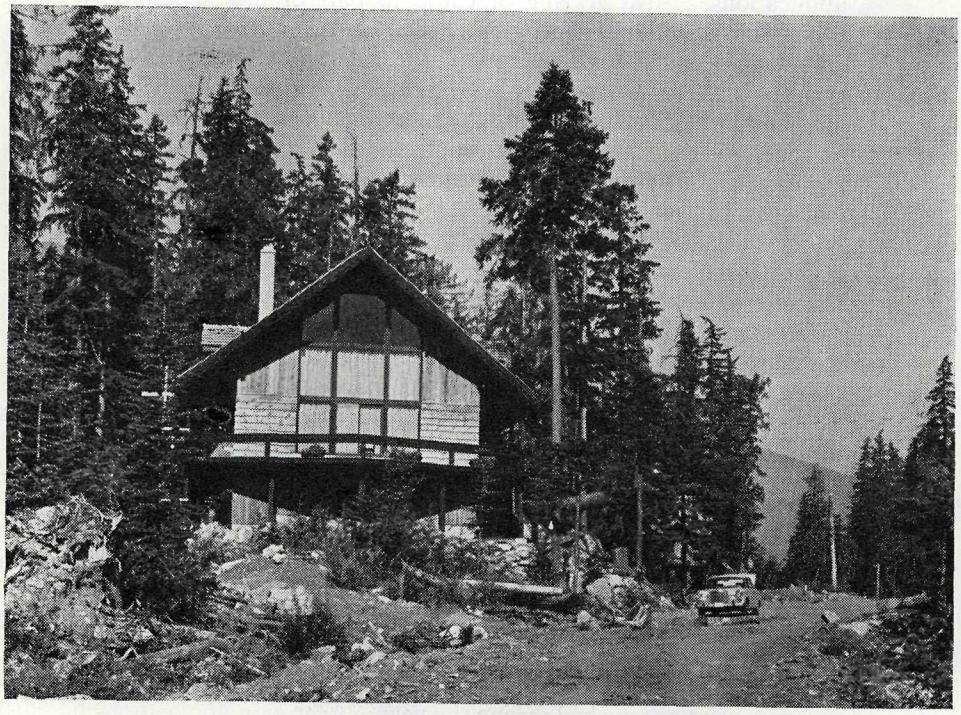
Easement Section—In 1970, 142 easements were granted as compared to 196 granted in 1969. Easements for oil and gas pipe-lines and well-sites totalled 31 in 1970 as compared to 86 in 1969. This decrease is probably caused by the current economic situation together with a decline in the discovery of new oil and gas fields.

GENERAL ACTIVITY

During 1970 a total of 16 parcels was tendered for lease; the acreage involved was 2,026.65 acres and the bonus bid revenue realized was $3,475.39. In addition, 293 lots, most of which were within Crown subdivisions, were offered for lease by auction. The bonus bid revenue realized at the time of the auction amounted to $65,594. Fifty of the lots offered were waterfront properties.

One lot was tendered for sale and was disposed of for $1,500. Two lots were offered for sale by auction and were sold for $11,000.

The following tables indicate in detail the work carried out by the various sections of the Lands Branch in 1970.



Ski chalet in Garibaldi-Whistler subdivision near Alta Lake.

Table 1—Country Land Sales, 1970

	Acres
Unsurveyed	242.00
Surveyed	22,841.60
Total	23,083.60

Table 2—Certificates of Purchased Issued, 1970

Land Recording District	Total
Alberni	13
Atlin	---
Burns Lake	4
Clinton	6
Cranbrook	8
Fernie	9
Fort Nelson	6
Fort St. John	43
Golden	---
Kamloops	28
Kaslo	6
Nanaimo	6
Nelson	7
New Westminster	5
Penticton	18
Pouce Coupe	18
Prince George	18
Prince Rupert	2
Quesnel	9
Revelstoke	1
Smithers	17
Vancouver	6
Vernon	5
Victoria	6
Williams Lake	27
Total	268

Table 3—New Leases Issued, 1970

	Number	Acreage
Land—		
Agriculture	463	118,805.61
Hay and grazing (pasture and hay-cutting)	129	37,769.54
Quarrying (sand, gravel, limestone, etc.)	20	968.72
Home-site (section 78, *Land Act,* R.S.B.C. 1960)	6	106.10
Residential	881	5,736.00
Miscellaneous (resorts, service-stations, camp-sites, mill-sites, etc.)	135	7,273.46
Foreshore—		
Booming, log storage, log-dumping, etc.	97	2,042.05
Oyster and shellfish	4	11.48
Industrial (canneries, mill-sites, wharves, etc.)	5	12.77
Quarrying (sand, gravel from river beds)	1	3.50
Commercial (boat rentals, marinas, marine service-stations, etc.)	41	151.68
Miscellaneous (private wharves and boat-houses, etc.)	24	91.19
Totals	1,806	173,332.10

Table 4—Temporary Tenure Leases Renewed, 1970

Number	1,014
Acreage	329,699.89

Table 5—Land-use Permits Issued, 1970

Number	36
Acreage	120.88

Table 6—Licences to Occupy Issued, 1970

Number	15
Acreage	374.00

Table 7—Assignments Approved, 1970

Leases, land-use permits, licences of occupation	821

Table 8—Easements Granted, 1970

	Number	Miles	Acres
Foreshore			
Submarine power cables	3	2.570	70.725
Submarine telephone cables	5	4.420	26.468
Overhead power-lines	5	0.567	3.724
Overhead telephone cables	3	0.128	0.315
Pipe-lines	2	0.103	0.190
Water pipe-line	1	0.171	0.420
Sewer outfalls	4	0.375	3.967
Totals	23	8.334	105.809
Land			
Oil and gas pipe-lines and well-sites	31	66.046	549.420
Cathodic site	1	0.091	0.220
Power-lines	36	24.209	203.334
Telephone pole lines	7	759	2.447
Microwave sites	3	.....	22.310
Microwave sites and power-lines	7	8.844	93.125
Television antenna site and power-line	2	1.421	17.461
Radio sites and power-lines	6	3.575	31.946
Radio reflector sites	2	.....	3.770
Telephone underground cable	1	0.184	0.223
Telephone remote-grounding system	1	0.569	0.690
Aerial tramway	1	0.571	7.840
Ski chair-lift and T-bar	2	1.770	5.374
Water pipe-lines	3	0.403	2.040
Sewer line	1	0.047	0.114
Totals	104	108.489	940.314
Licence of Occupation			
V.H.F. radio site	12	.....	12.250
Southern Okanagan Lands Project			
Underground telephone cable	1	0.090	0.109
Transmission-line	1	2.059	4.412
Water pipe-line	1	0.177	0.430
Grand totals	142	119.149	1,063.324

In line with current Departmental policy, 87 letters of consent for the construction of access roads were issued during the year.

The construction of three smaller power-lines was authorized by letter of consent in 1970.

Table 9—Crown Grants Issued, 1970

Purchases (country lands)	501
Purchases (town lots)	100
Pre-emptions	32
Surface rights (*Mineral Act*)	17
Public Schools Act	6
Veterans' Land Settlement Act	6
Home-site leases	3
Pacific Great Eastern Railway Company	13
Miscellaneous	30
Total	708
Certified copies of Crown grants issued	4

Table 10—Crown Grants Issued for Past 10 Years

1961	1,074
1962	1,081
1963	1,042
1964	1,163
1965	1,087
1966	1,020
1967	980
1968	957
1969	931
1970	708
Total	10,043

Ten-year Average, 1,004.

Table 11—Total Area Deeded by Crown Grant, 1970

Purchases (country lands)	49,762.48
Pre-emptions	4,810.60
Surface rights (*Mineral Act*)	673.78
Public Schools Act	50.46
Veterans' Land Settlement Act	183.30
Home-site leases	20.30
Pacific Great Eastern Railway Company	1,017.90
Miscellaneous	1,893.61
Total	58,412.43

Table 12—Pre-emption Records, 1970

	Pre-emptions			Certificates of Improvements Issued
	Applications Received	Applications Allowed	Cancelled	
Alberni	----	----	----	----
Atlin	----	----	----	----
Cranbrook	----	----	----	----
Fernie	----	----	----	----
Fort Fraser (Burns Lake)	2	1	----	1
Fort George (Prince George)	3	2	----	1
Fort Nelson	----	1	----	----
Fort St. John	1	2	6	17
Golden	----	----	----	----
Kamloops	----	----	----	----
Kaslo	----	----	----	----
Lillooet (Clinton)	----	----	----	----
Nanaimo	----	----	----	----
Nelson	----	----	----	----
New Westminster	----	----	----	----
Osoyoos (Vernon)	----	----	----	----
Pouce Coupe	6	15	9	9
Prince Rupert	----	----	----	----
Quesnel	1	----	----	----
Revelstoke	----	----	----	----
Similkameen (Penticton)	----	----	----	----
Smithers	1	----	----	----
Telegraph Creek (Prince Rupert)	----	----	----	----
Vancouver	----	----	----	----
Vernon	----	----	----	----
Victoria	----	----	----	----
Williams Lake	----	1	----	----
Totals	14	22	15	28

Table 13—Reserves, 1970

	Applications Received	Reserves Completed
Use, recreation, and enjoyment of the public	141	119
British Columbia Department of Highways (rights-of-way, gravel pits, bridge-sites, etc.)	142	112
Federal Government (defence purposes, wharf-sites, etc.)	46	38
British Columbia Forest Service (Ranger stations, grazing, radio sites, reforestation, etc.)	39	57
Miscellaneous (Game Branch, water-power projects, garbage dumps, school-sites, cemeteries, etc.)	109	97
Totals	477	423

General Summary

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	10-year Average
Pre-emption records issued	147	127	79	83	50	42	26	31	32	22	64
Certificates of improvements issued	18	22	32	29	43	48	50	42	37	28	35
Certificates of purchase issued	944	1,106	934	1,118	819	694	503	396	383	268	716
Crown grants issued	1,074	1,081	1,042	1,163	1,087	1,020	980	967	931	708	1,005
Total acreage deeded by Crown grants	75,486	67,989	77,354	93,579	86,166	115,917	117,672	129,307	81,881	58,412	90,376
New land sales—											
Number	944	1,106	934	1,118	819	694	503	390	383	268	716
Value	$673,655.53	$779,746.36	$658,950.00	$971,244.00	$966,020.00	$742,472.00	$681,850.00	$694,843.00	$1,046,341.21	$359,751.77	$757,487.39
Leases under *Land Act*	1,013	1,094	1,051	1,474	1,144	1,245	2,401	2,180	2,029	1,806	1,396
Acreage leases, *Land Act*	104,029	186,806	341,770	271,518	235,220	234,420	597,092	350,742	230,255	173,827	255,185
Temporary tenure leases renewed	100	93	125	317	223	376	485	716	962	1,014	441
Land-use permits	13	21	15	46	18	26	43	40	60	36	32
Licences of occupation, easements, etc.	7	18	13	18	12	8	22	35	27	15	17
Clearances of reverted mineral claims	282	458	418	429	456	840	889	884	917	672	624
Reservations for use and enjoyment of public and other purposes	581	547	528	397	370	304	458	380	418	423	441
Land Act collections	$1,704,776.84	$1,769,877.98	$1,936,834.00	$2,452,891.00	$2,479,918.00	$3,207,611.00	$2,833,534.00	$3,213,466.00	$3,804,463.00	$2,811,655.66	$2,621,502.75

LAND INSPECTION DIVISION

L. D. FRASER, B.SC.A., P.AG., A.A.C.I., CHIEF

A number of staff resignations, and the absence from work of the Chief Land Inspector for an extended period due to illness, greatly complicated the work programme of the Inspection Division during 1970. Although the total time lost due to the staff vacancies amounted to 11.5 per cent of the work force, there were 5,608 examinations made, a drop of 8.6 per cent from the 1969 level and down only 7.4 per cent from the average figure for the period 1966 to 1970, inclusive.

Individual year-end figures, together with the total of outstanding inspections for each of the 17 inspection districts as well as inspections completed by the British Columbia Forest Service may be seen by reference to Table 2. It will be noted that as of December 31, 1970 there were 1,313 inspections outstanding. This represents an increase of 40 per cent over 1969 and 36 per cent over the average figure for the five-year period ending in 1970. Had it not been for the generous assistance provided by the Topographic Division in making the De Havilland Otter aircraft available to the Division during the early spring and again in the fall, it would not have been possible to reach many of the more remote locations in the Province, and the inspections outstanding at year-end would have been much greater. In the process of completing the required inspection work, the Otter logged a combined total of approximately 100 hours.

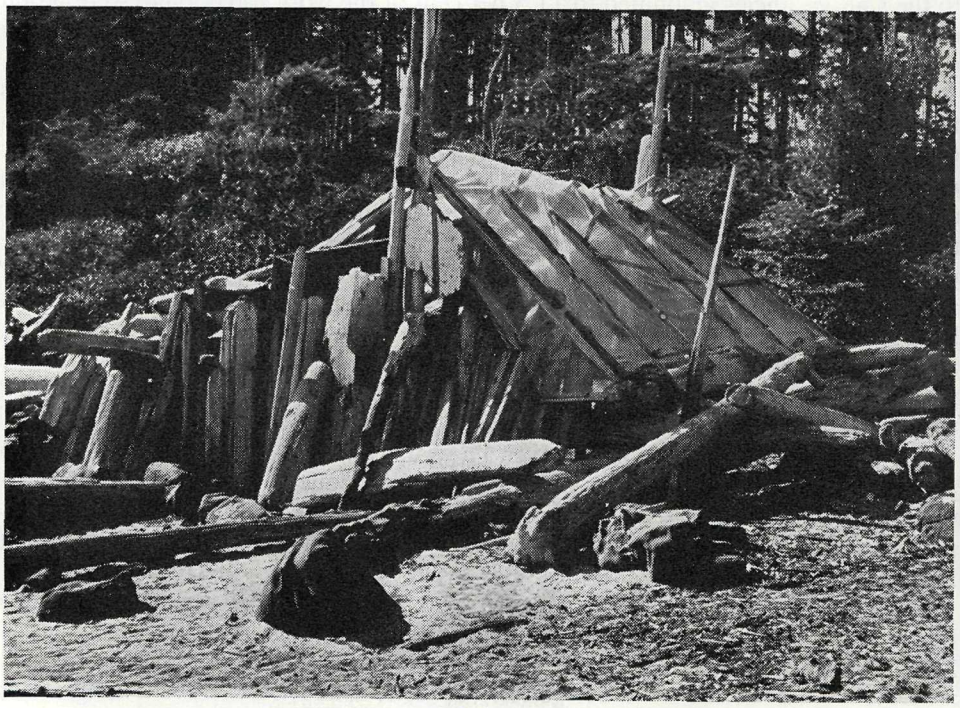
In 1969, for the first time in over 10 years, there was a slight decrease from the previous year in the number of new inspection requests processed. The downward trend continued in 1970 with a further reduction from the 1969 level of 2.4 per cent to a total of 5,834 new requests, a figure which is less than 1 per cent below the average annual figure for the five-year period shown in Table 3.

The policy change instituted by the Department in 1969 which makes it no longer necessary to undertake a field inspection following the initial three-year leasehold tenure period has resulted in a sharp decrease in the number of inspections made which fall in the lease categories. In 1969 there were 1,643 examinations made of leased land, other than foreshore, for the purpose of reviewing the rental and determining if diligent use is being made of the land. The figure for 1970 stands at only 880. It will be noted by reference to Table 1, which shows the type of inspections completed during the year, that of all the inspections completed 4,043 or 72 per cent of the total fell in the various lease categories. Applications to lease and renewal of leases for other than foreshore areas totalled 3,574 or 63.7 per cent of all inspections completed. In 1969 these figures stood at 75 per cent and 68.4 per cent respectively. Apart from the aforementioned decrease in inspections for the purpose of reviewing the rental and a rather significant increase in the demand for land for summer-home site purposes, the general type of inspections completed and the numbers falling in each of the various categories listed in Table 1 did not change greatly from 1969.

The total number of examinations made and appraisal reports submitted for other departments and agencies during 1970 was considerably below the number completed in 1969 and the average level reached during the past five years. The hours of work required for each of the examinations completed were, however, well above the average time devoted to most other inspections. Detailed appraisals were made for the British Columbia Hydro and Power Authority, the Parks Branch, and the Fish and Wildlife Branch.

As all land applications must now be referred to either regional district or municipal officials prior to adjudication, depending on the location of the area under

application, an increasing amount of time is being spent by Land Inspectors in discussions with these administrative bodies as well as in attending Technical Planning Committee meetings. Zoning and subdivision control by-laws which are now being progressively developed by the various regional districts are beginning to show their effect on the pattern of land alienation and will undoubtedly have a profound influence on land applications during the next few years.



Typical squatter's shelter constructed in trespass on Crown land.

Applications for agricultural purposes still represent the major portion of the work load in the Peace River region, but the very active interest displayed in previous years is down considerably. This decline in activity is mainly due to three consecutive poor crop years, as well as the continued decrease of accessible land suitable for agricultural development. This downward trend, coupled with the previously mentioned policy change which has removed the need to inspect areas held under lease for agriculture and residential purposes following the initial three-year term of the lease, has resulted in a significant decrease in the total number of new inspection requests received at the two Land Inspection offices located in the Peace River areas. At the Fort St. John office the decrease was 41.2 per cent, while at Pouce Coupe an even greater change took place with a decrease of 44.9 per cent. As a result of this decline in activity, the outstanding backlog of work at year-end stood at an all-time low.

In the North Peace River area a total of 610,000 acres of land was examined, 385,450 acres of which were involved in a land-use study made of a block of land located between the Beatton River on the west and the Alberta boundary on the east and the Chinchaga River on the north and the old Peace River block on the south. This study made it possible to deal with a large number of pending applications in an efficient manner and to plan for a potential road system around extensive

areas of muskeg. A land-use study of a block of land containing approximately 82,000 acres and situated just south of the Peace River and to the west of the Alaska Highway was commenced during the year and should be finalized early in 1971.

The demand for lakefront lots continues to increase, particularly south of the Peace River, as road systems are extended and improved. The planned completion of the Pacific Great Eastern Railway to Fort Nelson in the fall of 1971, and the recently announced extension planned to link Fort St. James with Dease Lake, is encouraging resource development in the more remote sections of the Province and in particular that section located north of the Peace River. With this new interest generated in the north, the tourist industry is growing and applications for hunting lodges and commercial fishing camp-sites are steadily increasing.

In the Prince George-Vanderhoof area there was a 23.7-per-cent reduction in new inspection requests processed during 1970. The reduction from the 1969 level in the Prince George Land Inspection District was 18.6 per cent and was even more pronounced at 28.8 per cent in the Vanderhoof Land Inspection District. This decline in new inspection requests is due to three main causes—firstly, the establishment of large forest reserves during 1969 and 1970; secondly, the policy change which removed the need to inspect areas held under lease for residential and agricultural purposes following the initial three-year term of the lease; and most important of all, the moratorium placed on Crown lands located within the Prince George, Vanderhoof, Burns Lake, and Smithers Land Inspection Districts. Since it is necessary in order to apply for land for agricultural purposes within the moratorium area to own farm land in the vicinity and to have developed it to a specified minimum level, the Land Inspector is required to make two land examinations for every application received for agricultural purposes. Before making an inspection of the Crown land under application he must first of all determine if the applicant meets the standards required to apply for agricultural land in the moratorium area by inspecting the applicant's existing holdings.

The only significant trend in the type of applications processed in the Prince George Land Inspection District during 1970 was a marked decrease in applications to lease for grazing. This trend is in common with that experienced in other areas of the Province and can be attributed to instructions issued to Land Commissioners in 1969 restating policy with respect to applications for grazing in areas administered under the *Grazing Act*. This policy requires that, before an application can be made for grazing, a letter must be obtained from the District Forester confirming the existence of special circumstances which would make administration of the particular area of Crown range impractical under the *Grazing Act*.

An active interest in summer-home sites continued through 1970 in the Prince George-Vanderhoof area. The expected impact on the demand for land in that section of the Vanderhoof Inspection District affected by the extension of the Pacific Great Eastern Railway from Fort St. James to Takla Lake has been tempered somewhat by the establishment of forest reserves. Interest in residential sites in the Fort St. James area has been stimulated by the development of the railway, and to meet the growing demand a 27-parcel subdivision was undertaken during the year. Although activity in the area is expected to level off somewhat in 1971, a further Crown subdivision may be required.

Additional work was done during 1970 on the land-use study of the area located between Fort St. James, Grand Rapids, and Stuart-Pinchi Lakes, situated in the Vanderhoof Land Inspection District. A study to determine the present and future requirements of the forest industry on Trembleur and Takla Lakes was also undertaken.

The Prince Rupert Inspection District was reduced in size slightly by the deletion early in March of the most southerly Mainland portion lying between 51° north and 53° north latitude. This area was added to the Williams Lake Land Inspection District because of the greater ease of access from the Bella Coola end of the Williams Lake District. Inspection requests received in the Prince Rupert, Smithers, and Burns Lake Districts were down by 14.7 per cent from the 1969 level. This decline was only partly due to the aforementioned boundary change. The previously mentioned moratorium on applications for agricultural purposes which covers all of the Burns Lake and Smithers Land Inspection Districts is the largest single factor which can be attributed to this downward trend.

In the Burns Lake Land Inspection District, applications to lease for summer-home site purposes showed a significant increase over the 1969 level. A continued rise in the population as a result of the industrial developments at Granisle and Houston will undoubtedly result in an increased demand for land for recreational purposes, and it is anticipated that there will be a further increase in summer-home site applications during 1971.

Due to the existence of mineral claims it has not been possible to date to proceed with the proposal made in 1968 to subdivide a parcel of Crown land situated in the Hudson Bay Prairie area of Hudson Bay Mountain, located in the Smithers Inspection District. While the Ski Club continues their efforts to obtain quit claims from the holders of the conflicting mineral claims, development in the area continues to progress. There are now 42 private cabins, 1 ski club cabin, 3 ski tows, a parking-lot, a ski lodge, and 2 television repeaters. While there is considerable evidence of a growing interest in land for recreational purposes in the Smithers Land Inspection District, there was very little change from the preceding year in the various types of applications dealt with during 1970.

Although there was a decrease from the 1969 level in the number of new applications received in certain parts of the Prince Rupert Land Inspection District during 1970, there was a very significant increase in applications on the Queen Charlotte Islands for agriculture and residential purposes. This increase is a result of an influx of people associated with the expansion of the Canadian Forces Base at Masset, as well as newcomers to the Islands, many of whom are said to be escaping the pressures of urban life in the major cities of North America.

Planning was undertaken during the year for a colony-type subdivision on Meziadin Lake in anticipation of demand for residential purposes following completion of a bridge over the Nass River to complete the final link from Highway 16 to the Stewart–Cassiar Highway. As the proposed bridge construction did not take place during 1970 as previously planned, completion of the subdivision may yet coincide with the proposed road link-up in 1971. Since the Stewart–Cassiar Highway traverses an area of outstanding natural beauty as well as an area which is said to be rich in resources, it can be expected that there will be a very significant increase in applications in this section of the Prince Rupert Land Inspection District when the road link-up is completed.

New requests received during the year in the Quesnel Land Inspection District increased by 14.9 per cent from the 1969 total. The major increase took place in applications to lease for residential purposes, with applications for agricultural development remaining at the 1969 level. Over a third or 38.5 per cent of the number were applications to lease for agriculture, with 23 applications or 66 per cent of the total applications to lease for agriculture being located in the Special Sale Area. Since the Special Sale Area requirements are identical to the requirements set in the previously mentioned moratorium area, a large amount of the Land Inspector's time was required to deal with these agricultural applications.

The emphasis on land use in the Cariboo is undergoing a dramatic change from ranching to recreational use. This section of the Province has become a retreat to many residents of the Lower Mainland, and as a result there is an ever-increasing demand for lakefrontage lots in the Williams Lake and Clinton Land Inspection Districts. In 1970, 28.2 per cent of all applications completed were for this type of land use, an increase of approximately 8 per cent over the 1969 figure.

In the Clinton District, little of the remaining unalienated lakefrontage is directly accessible by road. During 1970, inspections were made of sites fronting on 16 different lakes, and as road access was nonexistent in the majority of cases, access had to be gained by boat. Eleven lots located in a subdivision on Young Lake were offered by public competition, with competitive bidding for the right to acquire these summer-home sites on a leasehold basis, resulting in payment of $9,460 in bonus bids. A large subdivision of nonwaterfront lots was developed in a second tier located behind existing waterfront lots along the south shore of Green Lake, and it is expected that the 113 lots provided will be alienated by public auction during 1971.

In the Williams Lake Land Inspection District there was a 51.3-per-cent increase in new requests received during 1970 over the figure for 1969. This very substantial increase is mainly due to the increased interest in the Cariboo area, but partly due to the boundary change which involved the addition of an area which was formerly part of the Prince Rupert Land Inspection District lying west of the Coast Range and located between 51° north and 53° north latitude. No new subdivisions were undertaken in the Williams Lake Land Inspection District during the year, although 43 lots developed during 1969 were auctioned, with $5,838 realized in bonus bids.

New inspection requests received in the Kamloops Inspection District increased by 28.4 per cent over the 1969 total and to a level of 14 per cent above the average figure for the five-year period ending December 31, 1970. The biggest increase occurred in applications inspected for summer-home site purposes, which totalled 152, an increase of 120.3 per cent over the figure for 1969. With new industrial development taking place and high land values in urban centres such as Kamloops, there is also a noticeable increase in demand for rural home-sites. In order to meet this demand, certain selected areas of Crown land will be examined in 1971 with a view to providing a number of lots by subdivision.

In the Kelowna Land Inspection District the work load was down 15.5 per cent from the 1969 level, but only slightly below the average for the five-year period 1966 to 1970. Applications under section 102 (2) of the *Land Registry Act* to obtain accreted lands on lakes in the Okanagan continue to increase. The open-pit mine development being undertaken by the Similkameen Mining Company in the area 10 miles west of Princeton, estimated to involve a total investment of approximately $80,000,000, has had an impact on the economy of that section of the Province and has resulted in a sharp increase in the demand for Crown land in the Princeton area.

The volume of work received and type of inspections completed in the Nelson Land Inspection District during 1970 was very similar to that processed in the preceding year. The total of new inspection requests received was about equal to the five-year average, but down 6.4 per cent from the 1969 total. Zoning implemented by the regional districts, together with the establishment of forest reserves, is expected to result in a further decrease in land applications during 1971. Improved road conditions throughout the Kootenays should result in an increase in tourist traffic and the demand for land, particularly in those areas with a potential for recreational and residential development, should increase. Four subdivisions

were developed during 1970 in an attempt to meet at least part of the present demand, and during 1971 studies will be made of areas at Golden, Ta Ta Creek, Elko, and Creston for the purpose of developing additional lots by subdivision.

The progressive increase in the work load in the two Lower Mainland inspection districts, which has been apparent during the past few years, continued at an accelerated rate during 1970. A total of 728 new inspection requests were received, an increase of 29 per cent over 1969, and a figure well above the five-year average. The desire of people to escape the pressures of city life is evident in the Lower Mainland area as in other parts of the Province, and as a result an increase of 17.4 per cent over the 1969 figure occurred in applications inspected for permanent residential and summer-home site purposes. In response to the demand for retreat-sites, 85 lots were offered in a subdivision located at Post Creek in the New Westminster Land Inspection District. The development of further lots at this location is planned as well as in a second nonwaterfront subdivision at Devine near Anderson Lake. In the Vancouver Land Inspection District, several small subdivisions situated on the Sechelt Peninsula, on Texada Island, and in the Powell River area were initiated during 1970, and should help to satisfy some of the demand for small residential sites during 1971.

A vast area in which land examinations were formerly handled by the Forest Service, located opposite Vancouver Island and extending from Ramsay Arm to Cape Caution and inland to the south boundary of Tweedsmuir Park, was added to the Courtenay Land Inspection District during 1970. This addition is the chief reason for the large increase of 52.1 per cent in new work processed in that district during 1970, and results mainly from the discovery of numerous instances where Crown foreshore was being used in trespass. While it is highly unlikely that the same volume of work will occur in this new area once all areas used in trespass have been examined, the volume of work in the Courtenay District will nevertheless likely remain at a high level during 1971 due to the continued development taking place throughout the north end of Vancouver Island. New industrial development of note in 1970 was the completion of the new cedar mill at Tahsis and the commencement of work by Utah Construction and Mining Company on the copper mine at Rupert Inlet near Port Hardy.

There was a 32.7-per-cent decline from the 1969 figure in new inspection requests received in 1970 in the Victoria Land Inspection District. Of the inspections completed, 52.9 per cent were examinations of foreshore areas. Each year examinations made of areas which fall in this category are becoming much more time-consuming due to the increased frequency of protests received against industrial and commercial use of foreshore and the resulting detailed investigations and interviews which are required to resolve the conflicting interests.

TRAINING

Two Deputy Land Inspectors and one Land Inspector obtained their accreditation with the Appraisal Institute of Canada during 1970, bringing the total of accredited staff members, including the Chief and Assistant Chief Inspectors, to 10. Two Land Inspectors completed all the requirements of the Appraisal Institute of Canada but had not received accreditation as of year-end. Eight Land Inspectors and six Deputy Land Inspectors have successfully completed all the required course material in the Appraisal educational programme, and most of these individuals are now actively engaged in finalizing the necessary demonstration appraisal reports required to meet the accreditation standards. Three Land Inspectors have completed Part I and are proceeding with Part II of the Appraisal course. One of the Land

Inspectors taken on staff in the fall is studying Part I of the new four-year course, while one other Land Inspector who commenced employment with the Division late in the year was not able to begin the Appraisal studies. After successfully completing Part I, one Land Inspector decided not to continue with Part II of the Appraisal course due to plans to resign early in 1971. One Land Inspector and one Deputy Land Inspector successfully completed the new background course in economics offered by the Appraisal Institute of Canada.

Two Land Inspectors have completed the three-year public administration course, while one Land Inspector and the Assistant Chief Land Inspector are now in the process of completing the final year. One other Land Inspector is registered in the second year of this course.

STAFF CHANGES

As of January 1, 1970, there were two vacancies in the full field staff complement, which consists of 33 Land Inspectors and Deputy Land Inspectors. Staff resignations during the year resulted in the Division operating for the full year at only 88.5 per cent of full strength.

Resignations occurred on the following dates: Mr. K. G. Stearns, March 3, 1970; Mr. L. A. Gosselin, June 5, 1970; Mr. J. B. MacNaughton, June 26, 1970; Mr. D. B. Lymburner, July 10, 1970; Mr. H. Patzelt, August 31, 1970.

As a result of the aforementioned staff vacancies, the following Land Inspectors were taken on staff on the dates noted and were assigned to the following offices: Mr. D. E. Derkatz, January 5, 1970, Fort St. John; Mr. A. A. Hadland, October 14, 1970, Williams Lake; Mr. E. Warnock, October 15, 1970, Kamloops; Mr. L. C. Sorken, November 2, 1970, New Westminster.

Mr. E. S. Gowman, Deputy Land Inspector, formerly stationed at Fort St. John, was transferred to Smithers at the end of February and was the only transfer which took place during the year. As of December 31, 1970, there were three vacancies on staff, although one vacancy was in the process of being filled at year-end.

STATISTICS

Table 1 represents a summary of the number and type of inspections completed in the Province by this Division during 1970. Table 2 represents a comparison on a year-to-year basis of the volume of field work completed and requests outstanding at the end of each year for the period 1966 to 1970, inclusive.

Table 3 represents an analysis of requests for inspections processed by this Division for the years 1966 to 1970, inclusive.

Table 1—Types of Inspections, 1970

Purchases—	
Agriculture (other than grazing)	118
Access (roads, etc.)	12
Commercial (resorts, service-stations, hotels, airfields, etc.)	29
Community (cemeteries, church-sites, parking areas, etc.)	13
Grazing (pasture, range)	2
Homesites (permanent)	92
Industrial (mill-sites, power-sites, manufacturing plants, etc.)	44
Summer home or camp-site	3
Woodlots or tree farms	3
Others	23
Leases—	
Land—	
Agriculture (other than grazing)	883
Commercial (resorts, service-stations, hotels, airfields, etc.)	139
Community (parks, cemeteries, dump-sites, etc.)	37
Fur-farming	7
Grazing (pasture, range, hay-cutting, etc.)	202
Home-sites (section 78 of the *Land Act,* R.S.B.C. 1960)	8
Home-sites (permanent, other than section 78 of the *Land Act,* R.S.B.C. 1960)	495
Industrial (mill-sites, power-sites, manufacturing plants, etc.)	46
Summer home or camp-site	808
Quarrying (sand, gravel, limestone)	59
Reviews (rental and (or) diligent use)	880
Others	10
Foreshore—	
Booming and log storage or log-dumping	141
Commercial (boat rentals, marine service-stations, wharves, etc.)	114
Industrial (mill-sites, canneries, factory-sites, wharves, etc.)	24
Quarrying (sand and gravel from river beds)	6
Oyster and shellfish	14
Private (floats, boathouses)	26
Reviews (rentals and (or) diligent use)	138
Others	6
Land-use permits (*Land Act,* R.S.B.C. 1960)	40
Licences of occupation	35
Easements and (or) rights-of-way	31
Pre-emptions (*Land Act,* R.S.B.C. 1960)—	
Applications	18
Annual inspections (including applications for Crown grant)	151
Subdivisions—	
Valuations	19
Survey inspection	4
Plans cancellation	1
Proposals (lakeshore, residential, etc.)	35
Others	5

Table 1—Types of Inspections, 1970—Continued

Reserves—	
Historic site	1
Gravel pits	2
Recreational	74
Others	19
Veterans' Land Act	2
Doukhobor lands	3
Southern Okanagan Land Project	4
Pacific Great Eastern Railway	2
Other Agencies—	
British Columbia Hydro and Power Authority	3
Parks Branch	2
Fish and Wildlife Branch	1
Miscellaneous inspections—	
Assignments	7
Delinquent accounts	8
Escheats Act	2
Lake reconnaissance	25
Land-use surveys	20
Land revaluations of special nature	55
Protests	69
Section 53 (2), *Land Act,* R.S.B.C. 1960 (verifying improvements)	314
Section 78, *Land Act,* R.S.B.C. 1960 (*re* compliance with provisions of)	20
Section 131B, *Land Act,* R.S.B.C. 1960, and section 53, *Land Act,* 1970 (cases of doubt regarding inclusion of body of water in Crown grant)	13
Trespass (land)	44
Trespass (water)	110
Quieting Titles Act	5
Section 102 (2) of *Land Registry Act*	34
Section 85, *Land Act,* 1970 (land exchange)	8
Others	44
Total	5,608

Table 2—Analysis of Inspections Completed and Inspections Outstanding at Year-end for the Years 1966 to 1970, Inclusive

Land Inspection District	Examinations Made During—					Outstanding at End of—				
	1966	1967	1968	1969	1970	1966	1967	1968	1969	1970
Burns Lake	318	173	171	190	206	27	32	8	56	67
Clinton	226	266	271	462	374	40	64	212	89	147
Courtenay	303	274	353	325	377	15	36	61	24	85
Fort St. John	1,129	1,066	1,039	858	620	146	180	162	157	86
Kamloops	515	423	530	428	503	72	52	60	58	102
Kelowna	185	216	275	267	236	15	39	43	59	62
Nelson	307	250	324	369	313	37	45	16	9	35
New Westminster	274	245	247	303	301	34	7	49	23	91
Pouce Coupe	609	610	607	513	273	92	45	67	27	19
Prince George	423	433	387	406	318	68	27	52	74	111
Prince Rupert	194	180	165	146	194	34	38	26	74	49
Quesnel	191	241	266	185	179	38	33	32	14	25
Smithers	351	212	272	244	183	14	23	25	57	88
Vancouver	233	259	353	263	342	57	31	33	58	75
Vanderhoof	330	327	401	341	305	49	40	35	61	20
Victoria	156	189	137	252	189	46	4	16	48	50
Williams Lake	415	492	620	567	687	38	74	48	41	200
Headquarters	13	28	1	2	2	-----	-----	-----	-----	-----
Forest Service	20	36	9	16	6	14	11	13	7	1
Totals	6,192	5,920	6,428	6,137	5,608	836	781	958	936	1,313

NOTE—These figures include pre-emptions.

Table 3—Analysis of Requests for Inspection Processed by Land Inspection Division for Years 1966 to 1970, Inclusive

District	New Requests Received during—					Per Cent Change	
	1966	1967	1968	1969	1970	1970 Over 1969	1970 Over 1966
Burns Lake	194	180	147	238	217	—8.8	+11.9
Clinton	230	290	419	339	432	+27.4	+87.8
Courtenay	286	295	378	288	438	+52.1	+53.1
Fort St. John	929	986	924	840	494	—41.2	—46.8
Kamloops	532	402	537	426	547	+28.4	+2.8
Kelowna	173	239	279	283	239	—15.5	+38.2
Nelson	281	258	295	362	339	—6.4	+20.6
New Westminster	246	241	266	277	369	+33.2	+50.0
Pouce Coupe	506	508	569	376	207	—44.9	—59.1
Prince George	426	375	396	414	337	—18.6	—20.9
Prince Rupert	143	184	153	194	169	—12.9	+18.2
Quesnel	172	222	259	161	185	+14.9	+7.6
Smithers	187	221	274	276	214	—22.5	+14.4
Vancouver	260	233	355	288	359	+24.7	+38.1
Vanderhoof	320	307	386	354	252	—28.8	—21.3
Victoria	170	147	149	284	191	—32.7	+12.4
Williams Lake	420	524	591	557	843	+51.3	+100.7
Headquarters	13	28	1	2	2	.....	—84.6
Forest Service	27	36	11	18	0	—100.0	—100.0
Totals	5,515	5,676	6,389	5,977	5,834	.....	.....

Average change for 1970 over 1969 for Province is —2.4 per cent.
Average change for 1970 over 1966 for Province is +5.8 per cent.

SURVEYS AND MAPPING BRANCH

THE SURVEYS AND MAPPING BRANCH

The framework of maps and surveys so necessary for the orderly development and settlement of British Columbia is provided through the Surveys and Mapping Branch. That such scientific foundations were necessary even in the earliest days is shown by the fact that in 1851 the position of Colonial Surveyor for the young Crown Colony of Vancouver Island was created. In more than 100 years which have passed since Joseph Despard Pemberton was appointed first Surveyor-General, British Columbia has expanded immensely in all spheres of human endeavour. Much of the foundation for the way of life we have in British Columbia today rests on the reliability of our basic surveys. As British Columbia has progressed through time, so the surveys and maps of the Province have increased in magnitude and complexity.

It is the responsibility of the Surveys and Mapping Branch, through the Boundary Commissioner, to establish and maintain co-operatively the boundaries between this Province and the other adjacent Provinces and Territories of Canada. Within the Province, the Branch has established and is ever extending a basic network of triangulation surveys which are fundamental to determining geographical locations and co-ordinating property boundaries. The surveying procedures vary according to the intended purposes. Topographic surveys are constantly improving the portrayal of various physical features. Cadastral (legal) surveys, on the other hand, delineate the parcels of Crown lands subject to alienation under the *Land Act*. Finally, it is necessary to show on published maps the combined survey effort in order to give a visual account of the position of land alienation and geographic features of British Columbia. Maps must satisfy a wide range of uses, whether it be by the sportsman searching for an untapped valley or virgin lake, the homesteader seeking unsettled lands, or the industrialist planning new ways and new places to develop the resources of this Province.

So much for the uses of maps and surveys and their necessity. Also interesting is the great variety of techniques and equipment which must support our complex surveying and mapping organization. This includes photography from aircraft using precise cameras calibrated to less than a thousandth of an inch, modern optical surveyors' theodolites which read directly to seconds of arc, other instruments such as the tellurometer (a distance-measuring device which operates on a principal similar to radar), and plotting devices which are capable of precise mapping directly from aerial photographs. Helicopters and other aircraft speed surveyors to the remotest locations. Surveying is also expanding into the realm of electronic computers which can process the contents of field-notes in seconds compared with hours by manual methods. In all these ways, the science of surveying and mapping continues to serve the people by keeping pace with their needs and with the continual technological advances of our age.

The following is a brief summary of the functions of the various divisions of the Surveys and Mapping Branch:—

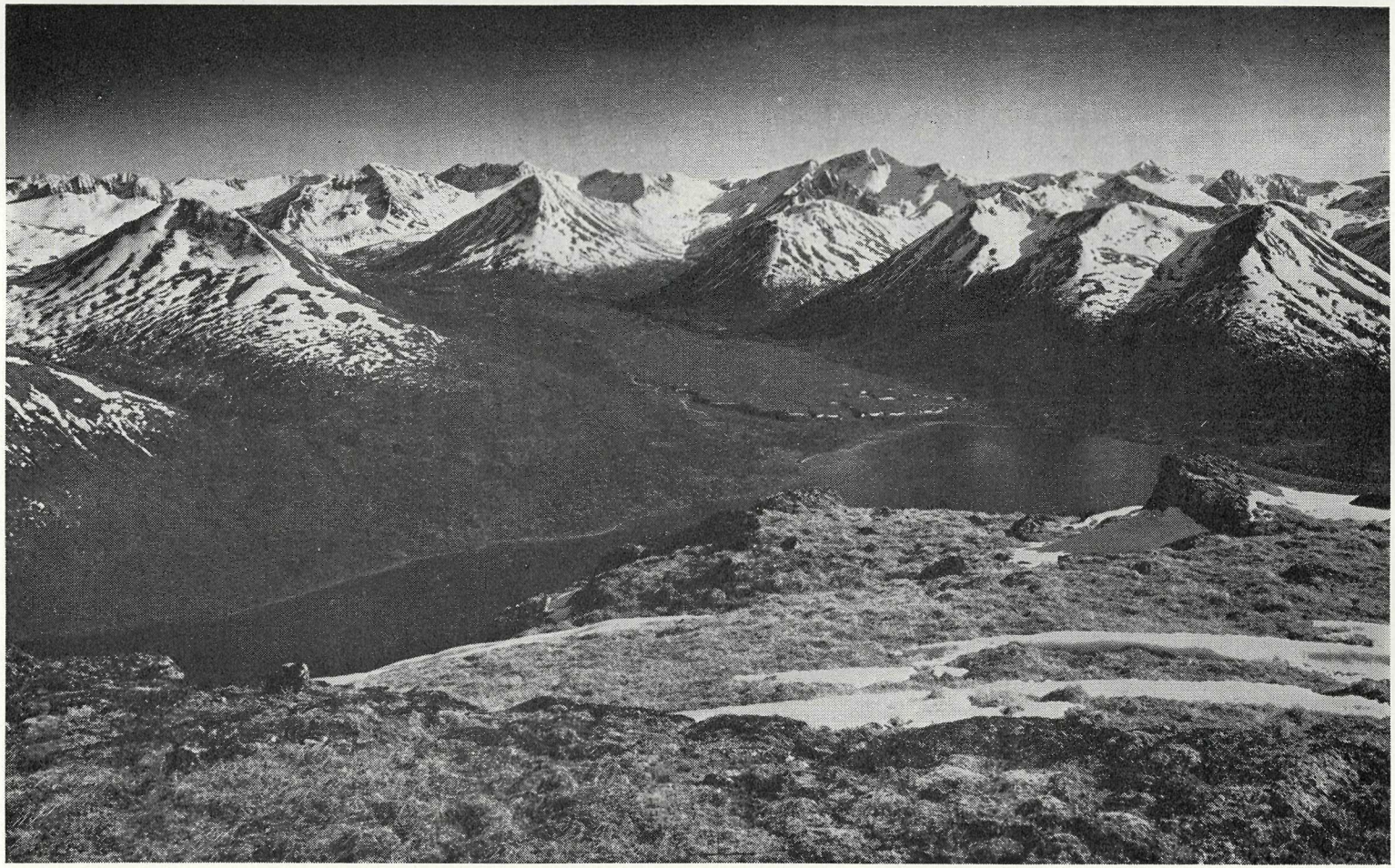
I. Administration.—General co-ordination of the four divisions of the Branch, being Legal Surveys, Geographic, Topographic, and Air; delineation and maintenance of boundaries under the Provincial Boundary Commissioner—namely, (*a*) Alberta-British Columbia Boundary and (*b*) British Columbia-Yukon-Northwest Territories Boundary; interdepartmental and intergovernmental liaison.

II. Legal Surveys Division.—Regulations for surveys under the various Provincial Acts, such as Land, Land Registry, Mineral, Petroleum and Natural Gas; instructions to British Columbia land surveyors regarding surveys of Crown lands and subsequent check of field-notes and plans of same; preparation and custody of official plans; preparation and maintenance of Departmental reference maps, mineral reference maps, and composite (cadastral) maps; processing for status of all applications concerning Crown lands; field surveys of Crown lands, highway rights-of-way, etc.; preparation of legal descriptions; operation of blue-print and photostat sections; computational scrutiny of certain land registry subdivision plans; inspection surveys; restoration surveys.

III. Geographic Division.—Map compilation, drawing and negative engraving, editing, and reproduction; map checking, distribution, geographical naming—Gazetteer of British Columbia; field and culture surveys for preparation of land bulletins and maps; preparation of legal descriptions for and delineation of administrative boundaries; compilation and distribution of annual Lands Service Report; trigonometric computation and recording of geographic co-ordinates; general liaison between this Department and Federal and other mapping agencies on exchange of survey and mapping data; checking well-site survey plans under the *Petroleum and Natural Gas Act*.

IV. Topographic Division.—Propagation of field survey control—namely, triangulation, traverses, and photo-topographic control; operation of Otter float-plane; helicopters on charter; compilation and fair drawing of manuscripts for standard topographic mapping; special field control for composite and photogrammetric mapping and other special projects; precise mapping from aerial photographs through the use of the most modern plotting-machines.

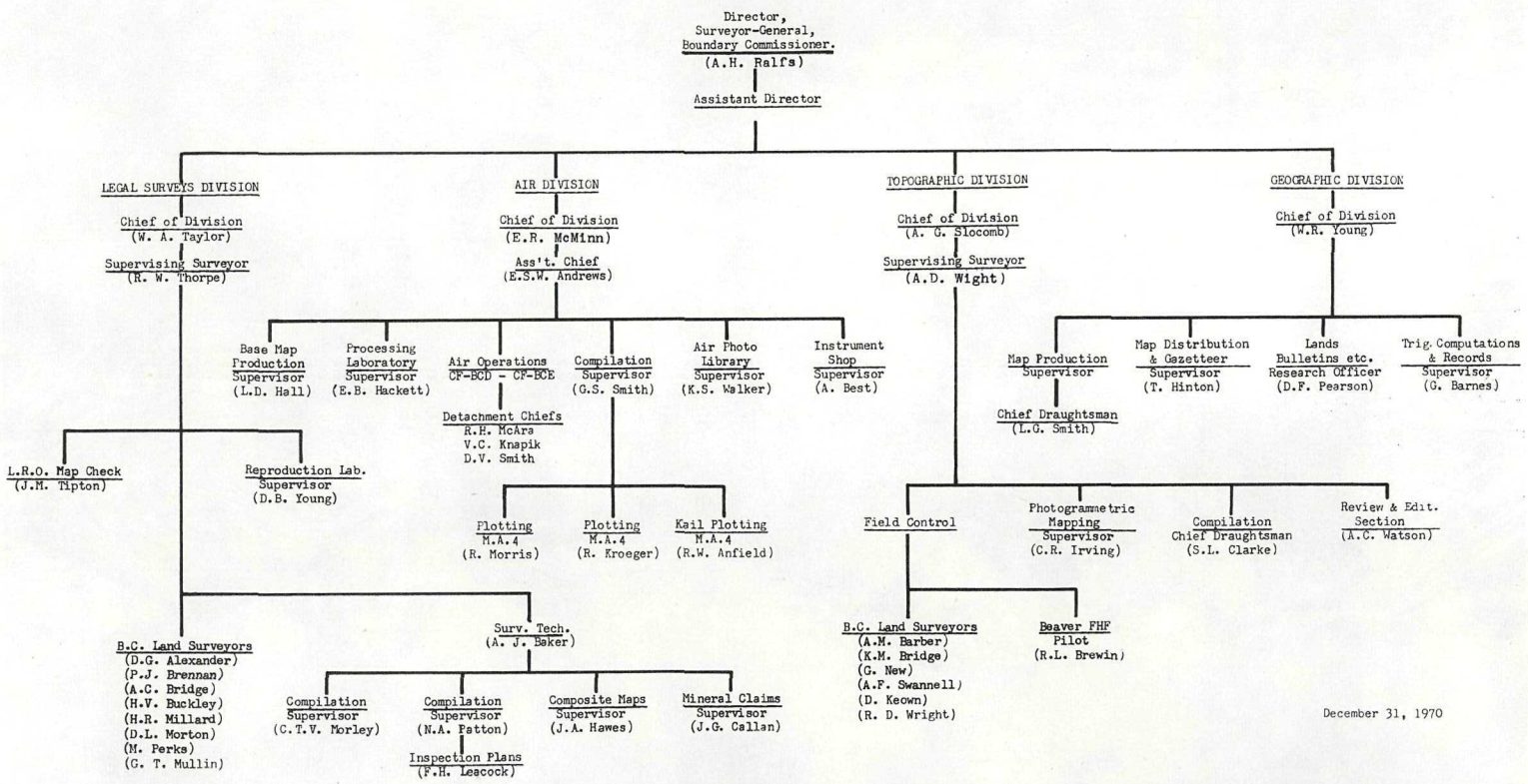
V. Air Division.—Aerial photographic operations involving maintenance and operation of two aircraft; photographic processing, air-photo distribution, and Provincial air-photo library; compilation of interim base maps, primarily for the forest inventory; air-photo control propagation; instrument-shop for the repair, maintenance, and development of technical equipment.



View from Station Barf across Cry Lake to Two Fish Creek, Cassiar Mountains

ORGANIZATION CHART

SURVEYS AND MAPPING BRANCH
DEPARTMENT OF LANDS, FORESTS, AND WATER RESOURCES



December 31, 1970

SURVEYS AND MAPPING BRANCH

A. H. RALFS, B.C.L.S., D.L.S., DIRECTOR, SURVEYOR-GENERAL, AND BOUNDARIES COMMISSIONER

Comprehensive changes were made to the survey sections of the new *Land Act* of 1970. The *General Survey Instructions to British Columbia Land Surveyors,* prepared and distributed under authority of section 64 of the *Land Act,* was also substantially revised and reissued. The general theme of these changes is to broaden the flexibility of surveys so that the size, configuration, and orientation of Crown lots may be more readily adapted to topography, drainage, and intended land use.

Regulations and principles for determining and delimiting natural boundaries and for interpreting natural as opposed to artificial accretion were further clarified and elaborated. Systematic interpretation of the rules and regulations is particularly important in determining water areas to be excluded from alienation, in describing the limits of foreshore lots, and in establishing the boundaries of subdivision lots on lakes having a controlled surface elevation.

The new Act introduces an important procedural change in processing surveys. Under authority of section 63, the Surveyor-General may directly accept, confirm, and file survey plans made under the Act. Removal of the mandatory requirement of *Gazette* notice of survey speeds up and simplifies the procedures for filing Crown land surveys.

In order to emphasize the right of public access, the Surveyor-General may instruct a surveyor to establish a road allowance through or along the edge of Crown lands being surveyed. Public rights-of-way, therefore, may be established prior to disposition. Although extra field work and plotting is required, this regulation has the dual benefit of specifically locating and reserving the Crown's access rights and reducing the ground area upon which the person acquiring the land pays taxes and fees.

The Minister of Lands, Forests, and Water Resources may also authorize the Surveyor-General to establish a public road allowance through Crown land for the purpose of providing access to privately owned property which is in the process of being subdivided. This policy also reinforces the rights of public right-of-way through unalienated lands, yet assures access to the holders of the subdivided lands.

While in most circumstances the district lot system of survey is logically suited to the land district divisions of the Province, it has an inherent weakness in so far as cartographic retrieval of information is concerned. Under the district lot system, lots are numbered sequentially as they are created, regardless of their location within the land district. Therefore, having been surveyed at different times, adjacent lots often have entirely unrelated numbers. A map user, therefore, may be handicapped if he has only a lot number for reference, because the number gives no clue to the lot's location. Provision is therefore made under section 61 of the *Land Act* to attach a unique co-ordinate reference to each district lot.

The Branch continues to extend the application of electronic data processing to many fields of activity. The reduction of geodimeter measurement has now been incorporated into the LSM 139 computer programme, leaving only aerotriangulation strip and block adjustments outside of the master programme. Interaction between aerotriangulation programmes and LSM 139 is very limited and, therefore, it has been decided to keep them as separate entities. Four new routines were devised for the LSM 139 system in 1970. These are routines to compute conversion between geographical and transverse Mercator co-ordinates; transform rectangular co-ordinates by scaling, rotation, and shifting; output the results of geodimeter reductions

on cards in a form designed for later input to the system as data for least-square adjustment; and process data for the plotting of longitudinal cross-sections.

Besides the Surveys and Mapping Branch, the Water Resources Service, Forest Service, and Department of Highways continue to be important users of the LSM 139 programme.

Work is continuing on tape-recording survey control-station data as extracted from punch-cards. At the end of the year, 15,000 stations had been recorded on the tape file. A printed list of the new stations and one or more index cards for each station are produced by two new programmes, LSM 140 and LSM 141.

Every survey has a specific object, and for economic reasons it is desirable that for a control survey the network shall have a configuration such that a minimum number of observations of a specified precision will achieve the required relative and positional accuracy of the surveyed points. The Geodetic Survey of Canada has developed programme GALS, which, in addition to computing and adjusting a surveyed network, can evaluate the strength of a proposed survey before any field observations are made. GALS has been made available to this Branch, but rather than introduce a new programme it has been thought advisable to modify the LSM 139 system to include this ability to pre-evaluate a survey. Great assistance toward this end has been obtained from Quebec Hydro, which made similar modifications to the COSMOS programme which was made available to it by this Branch in 1968. It is hoped that the appropriate modifications to LSM 139 will be completed early in 1971.

Due to the volume of applications to be processed, it is estimated that the average time taken to produce the status of a parcel or unsurveyed area of Crown land is one month, although the actual work may be a matter of hours only. For this reason, a start has been made on designing an electronic date processing system for recording, updating, and retrieving the status of Crown land in the Province. The investigation is still in an early stage, and no use of such a system, which will involve the conversion of all or part of existing records, is expected for several years.

The 50 map-sheets controlled by the Topographic Division field crews in 1970 is a new record for this type of work. This achievement is made even more remarkable by the fact that it took place in the rugged Cassiar and Omineca Mountains and Taku River regions of northern British Columbia, where developed surface access routes are still meagre and problems of weather and climate are constant concerns to those reponsible for doing the work. Although the Surveys and Mapping Branch is no stranger to northern work, we expect a continuing demand for surveys and mapping in this region.

Map distribution continued to rise, both in the total number of sheets issued and in value. Revenues from the sale of lithographed maps took a sharp leap in 1970, chiefly as a result of price increases initiated by Federal and Provincial authorities.

The Air Division, as in 1969, again chartered a high-performance jet aircraft with the intention of obtaining high-altitude 1 inch to 1 mile (80-chain) block photography north of the 55th parallel of latitude. Unfortunately, poor weather mitigated against plans for extensive northern coverage. Nevertheless, we were able to take advantage of better weather in the southern half of the Province where 80-chain photography contributed substantially to the refly of almost one-quarter of the total area of the Province. Some of the 80-chain photography was of high priority for the Federal Government, and we are expecting the Federal agencies concerned to reciprocate in the future by providing us with comparable coverage obtained under Federal contract.

Colour photography is becoming important in the field of remote sensing. It has been used successfully in a wide range of environmental and ecological studies such as ground-water detection, pollution, and tree-disease detection. Although 10 rolls of colour film were exposed in 1970, it has so far proven more economical to have the film processed and printed at the National Air Photographic Production Unit at Ottawa than to install expensive laboratory equipment.

A staff surveyor was again made available to the British Columbia-Yukon-Northwest Territories Boundary Commission. A field inspection in June revealed that the previous year's defoliant spraying operation between Watson Lake and Atlin Lake was ineffective. Although the Commission had prepared a new spray contract covering the line east of Watson Lake, it was cancelled until satisfactory arrangements can be made to respray the faulty section.

During the year, continuing correspondence was carried out with Government officials in Alberta concerning certain impending problems of administration in the vicinity of the Rocky Mountains section of the Alberta-British Columbia Boundary.

There is confusion, firstly as to whether the true boundary is the physical height of land of the Rocky Mountains as it exists on the ground or whether it is as shown on the official set of maps referred to in the pertinent statutes of both Provinces and the Federal Government. It is submitted by this Branch that the former interpretation is the only practical one for the carrying-out of legal or other surveys adjacent to the boundary. An amendment to the aforesaid statutes is required, therefore, for clarification purposes.

Secondly, there are a number of mountain passes crossing the boundary which require some boundary monuments therein, the straight lines joining which to be accepted as the official boundary. This was done and shown on the set of maps previously referred to, but only for those passes such as Crowsnest, Yellowhead, etc., which were, at that time, of economic importance. Many other passes not so recognized are now, or will be, of importance and require conventionalizing with a series of boundary monuments.

There is, unfortunately, no provision in the existing legislation for this to be done. It is hoped that both Provinces can arrange concurrently to carry out these two needed amendments to their respective statutes.

One of the Survey and Mapping Branch's long-term employees, Mr. H. L. E. Hooper, died suddenly in June, 1970. Les Hooper had served with four Chief Geographers and six Surveyor-Generals during his 46 years' employment in the Geographic Division, and played an important role in the preparation and publication of Provincial maps. He had a special ability for free-hand lettering, and prepared many illuminated scrolls. These will remain as unique memorials to his skills.

On August 31, Mr. Dan Pearmain retired after a happy association of 50 years with the Lands Service. Mr. Pearmain began his career as messenger but soon started to learn the intricacies of legal surveys draughting. By 1948 he had reached the position of Chief Draughtsman and three years later was promoted to the office of Chief of the Legal Surveys Division, which he held until his retirement.

A presentation and farewell dinner were held in Dan's honour on June 26.

LEGAL SURVEYS DIVISION

W. A. TAYLOR, B.C.L.S., CHIEF

The role this Division plays in the orderly carrying-out and recording of cadastral surveys in Crown land falls into three categories. The main function is close liaison with the Lands Branch in the processing of applications for disposition of Crown land. The second function is to provide service to other departments in matters of surveys and reproductions, to protect and administer their interest in Crown land. Thirdly, a field staff provides a service to the Lands Branch in development of areas of public interest, serves other departments in carrying out their legal survey requirements, and investigates complaints by the public in matters of boundary disputes and survey matters.

(1) LANDS BRANCH LIAISON SECTION

CLEARANCES

When an application for a disposition is received in the Lands Branch it must first be determined if the land belongs to the Crown, is free of encumbrances of other interests, and if it is sufficiently well surveyed to be disposed of. The first two matters are determined both from Lands Branch registers and Legal Surveys maps and plans. The matter of survey is decided by this Division. Clearances on 8,917 land parcels were made for this purpose and, in addition, clearances were made on 763 mining leases.

EXAMINATION SKETCHES

Land-examination sketches are prepared from a consolidation of survey data on file of every area, prior to its examination in the field by the Lands Branch personnel. This required the completion of 3,287 such plans, being a 10-per-cent increase over the previous year.

PLAN AMENDMENTS

The official plans of areas not requiring further survey frequently have to be amended to exclude roads that have been constructed since the survey was made and to exclude road allowances which are planned to serve lands beyond. This function has developed in the last year because of the increased awareness of access problems brought about by increased land costs and because the new *Land Act* of 1970 provided for creation of these roads under the *Land Act* for the first time. Amendments to surveys on file to delete roads numbered 600. This service has reduced the number of field surveys required, has served to protect such roads as forest access and petroleum development roads without, or at a reduced, field survey cost, but has made a considerable increase in our technical planning and draughting role and is a completely new function.

Amending official plans to exclude water areas has been with us for some years, again caused by statutory amendment to protect public interest in recreational water, and has increased to the point where 275 plans required amendment during the present year. New *Land Act* survey regulations in force this year reduced the width and area of creeks and lakes whose areas are excepted from a lease or grant. Although this is an advantage to the applicant for the disposition, in that he does not pay for water area to which he will not receive a lease or grant, it has increased the draughting work of the Division.

Additional official plan-amending is caused by changes in Departmental policy. A few years ago, waterfront lots were surveyed and leased with 198-foot frontage. Present policy allows a 100-foot maximum, consequently, expired leases, when renewed, are reduced and plans must be amended and newly dimensioned. Fifty of these were required on lots fronting water, with 45 of a similar nature on inland plans. A further 100 amendments to official plans were caused by survey of parts of surveyed lots.

Survey Instructions

Areas to be disposed of, requiring to be surveyed, necessitate that decisions be made on the type of plan, and pertinent Act, under which the survey should be carried out. Access is a big problem and, as costs of survey are directly related to this aspect, careful consideration is given to ensure the least amount of survey is demanded, consistent with security of title. Survey data in the form of original and supporting surveys is gathered and sent out to surveyors in private practice, engaged by the applicant for the disposition, along with the letter of survey "instructions," over the signature of the Surveyor-General. Although the number of such "instructions" has remained at a more or less even figure during the last several years (there were 1,074 this year), the problems of access and deletion of nonpublic roads to protect other Departmental interests, which is now given greater attention, increases the time engaged by preparation of these "instructions." It is at this stage in the disposition that a final check is made that the area that has been recommended does in fact conform to zoning sizes and uses in the various areas of the Province. With the advent of regional districts, the authority to set up parcel sizes has been fragmented by zoning and subdivision by-laws, and 29 authorities exist where one formerly was in control. This promises to greatly increase the complexity of our work.

Processing New Surveys

Surveys of dispositions, when completed, are returned to this Division for processing. As the surveys are divided into two main categories of *Land Act* and *Land Registry Act* surveys, they are funnelled into two different checking process sections on receipt. Under the *Land Act,* 643 survey plans were received, creating 872 district lots. These plans are checked mathematically with the electronic computer, plotted on reference maps, entered in lot and regional registers, confirmed by signature of the Surveyor-General, and copies distributed to Land Commissioners and to the Provincial Assessor at time of lease or grant. Surveys within jurisdiction of Harbour Commissions are sent directly to the appropriate commission.

Under the *Land Registry Act,* 437 subdivision and right-of-way plans were received and checked mathematically, and against adjoining surveys, plotted on maps and former plans, and entered in registers. They are duplicated in the Reproduction Section, and subdivision plans forwarded for approval to the Approving Officer, Department of Highways. All plans are eventually deposited in the appropriate Land Registry Offices.

Descriptions

Descriptions for alienation based on these plans are written for the Lands Branch, and this year 735 descriptions were written, consuming 215 man-hours. In certain situations, good survey practice allows an "explanatory" plan to be prepared to accompany a description. Normally this is a survey requirement to be completed at the expense of the applicant for the disposition. However, at least 20 of these are prepared every year in this Division in cases of financial need.

Finalization of Process and General

At the actual stage of disposition by the Lands Branch, lease documents and Crown grants require preparation of a linen tracing to be attached. Lease tracings prepared numbered 6,580, and Crown-grant tracings, in duplicate, numbered 801 (1,602).

In the process of clearing, amending, instructing for, and checking surveys, a total of 58,038 plans and sets of field-notes were removed from the vault, viewed, and (or) printed and returned for safekeeping, without apparent loss.

The Reproduction Section is an integral part of all the foregoing processes of disposition, yet only approximately 40 per cent of its output of prints and 10 per cent of its photographic output is for the use of the Department of Lands, Forests, and Water Resources. Actual use by the Surveys and Mapping Branch accounts for 15 per cent of prints and 2 per cent of photographic output.

Involved in the administration of surveys, requests for maps and field-notes, etc., were 4,697 letters received, of which 1,036 involved money transactions. Survey posts of standard design were supplied to and are stored in Government Agents' offices throughout the Province for use in Crown land surveys. Numbers and types of posts supplied appear in tabular form in this report.

Apart from the processing of applications for disposition, general draughting on existing maps of all interests in land initiated from many sources forms a large part of our work. A total of 36 new reference maps was prepared to replace worn-out linens or maps where the pattern of alienation is so intense and parcels so small that the scale needs to be enlarged. On the 260 existing reference maps, all new reserves for flooding, planning, special projects, Provincial forests, pulp-harvesting forests, forest access roads, petroleum-development roads, parks, etc., are plotted daily.

Project 1970

There are 10 categories of *General Survey Instructions* for conduct of surveys by British Columbia land surveyors. Differing types of surveys are covered by these regulations, and authority to issue them is given to the Surveyor-General by various statutes. The last previous editing was in 1959. Seven of the categories were amended and rewritten in the light of changing times. All 10 were reprinted and issued in loose-leaf form in a ring binder.

Distribution of Survey Posts

	B.C.L.S. Bars	Standard Pipe	Rock Post	Driveable Pin	Post Caps	Anchor Plates	Driveable Pipe	2½-inch Bolt
Amount on hand January 1, 1970	1,100	244	801	3,356	1,667	852	1	1,533
New stock	2,000	1,000	1,000	8,000	13,779	.....	1,500	.....
Totals	3,100	1,244	1,801	11,356	15,446	852	1,501	1,533
Legal surveys	1,355	85	34	480	197	.....	72	.....
Government Agents	50	.....	350	5,635	7,215	150	.....	325
Public surveyors	.....	35	306	206	1,306	.....	178	520
Total used in 1970	1,405	120	690	6,321	8,718	150	250	845
Balance on hand, December 31, 1970	1,595	1,124	1,111	5,035	6,728	702	1,251	688

Production Totals for the Years 1969 and 1970

	1969	1970
Field books received	583	583
Lots surveyed	1,077	872
Surveys examined	541	1,070
Lots gazetted or confirmed	724	743
Lots cancelled	20	24
Lots amended	308	162
Mineral-claim field books prepared	136	146
Reference maps compiled or renewed	22	36
Applications for purchase cleared	576	589
Applications for pre-emption cleared	13	7
Applications for lease cleared	7,301	7,625
Timber sales cleared	3,047	2,253
Crown-grant applications cleared	934	823
Cancellations made	600	2,293
Inquiries cleared	1,152	1,347
Letters received and dealt with	6,378	4,697
Examination sketches	2,997	3,287
Crown-grant and lease tracings made	6,466	7,381
Photographic prints made	48,991	167,123
Diazo prints made	429,047	302,417
Offset prints made	1,469,147	1,730,066
Xerox copies made	301,096	325,674

(2) SURVEY SERVICES TO OTHER DEPARTMENTS

Mineral Act

The number of requests received from private surveyors for survey information, together with the number of completed surveys filed with the Division for checking and approval, indicates a fairly high level of activity in mineral claim surveys. The figures supplied here only indicate those surveys which are completed and submitted for approval; however, many more surveys of a preliminary nature are performed and no record is available for this type of work. Eighty-four new mineral claim lots were received during the year. A total of 135 lots, which included a carry-over from 1969, was checked and approved. The holders of 11 lots indicated they intended to apply for mineral leases, so these were the only surveys to be officially gazetted.

The actual number of mineral claims examined in the course of the year was well in excess of the 135 quoted above. Many of the surveyed lots were perimeter surveys, for example, three lots surveyed in the Rupert Inlet area contained a total of 79 mineral claims. Each mineral claim involved in any survey is checked for its priority in relation to adjoining claims (using Mines Department records) and for its conformity to the Surveyor-General's regulations and the *Mineral Act*.

Petroleum and Natural Gas Act

Legal Surveys Division acts as a repository for final survey plans of petroleum and natural-gas well-sites. The plans are received from the Senior Development Engineer in the Petroleum and Natural Gas Branch, files are prepared for each well-site, and the position of each well is plotted on Departmental reference maps.

The mathematical check of each survey plan is done by the Trig Control Section of Geographic Division because all well-site surveys have to be tied to established control; however, all correspondence with the Petroleum and Natural Gas Branch and the surveyors who prepare the plans is carried on by Legal Surveys Division. During the year, 184 plans were received, approved, and filed. Of this total, 132 plans were received during the six winter months. Directly related to well-site survey are preliminary inquiries from oil companies, or their legal representatives; service companies; and land surveyors, requesting information as to surface status and survey information. Because of a limited working season and the need to move expensive equipment quickly, such inquiries are received generally by telephone or teletype, and replies must be handled immediately. There were 141 such inquiries in 1970, and again the greater proportion were received in the six winter months.

Descriptions

Apart from legal descriptions written in support of Departmental alienations of land, five jurisdictional boundaries' descriptions were written for the Department of Attorney-General, three descriptions of park boundaries were written for Parks and Recreation, and 12 pound districts were described for the Department of Agriculture.

Timber Sales

In previous years, all applications for timber sales were funnelled to this Division from the Forest Service, for clearance on Departmental reference maps against previous alienation or reserves. In mid-year a new agreement was negotiated with the Forest Service wherein they are now responsible for all timber sales within Provincial forests, and in order that they do this, new maps on film were supplied to them covering all forests. Applications to the Lands Service for rights-of-way are channelled to Forest Service as well as ourselves for map notation. Theoretically, only timber sales outside of forests are now cleared by this Division; however, this total amounted to 2,253 in the current year.

Land Registry Plan Checking

Previous to this year, plans deposited in Land Registry Offices, under the Department of Attorney-General, situated in Victoria, Kamloops, Prince George, Nelson, and a quota of those handled by the Vancouver and New Westminster offices, were mathematically checked in Legal Surveys Division by two men using the central computer. The five-day turn-around time, set as the maximum time which each plan should require for this check, was impossible to meet due to the increasing number of plans. As a result, the Victoria and Prince George offices unilaterally decided not to send in their smaller plans. Regrettably, the Victoria office apparently accepts plans at face value without adequate mathematical check, whereas Prince George has instituted a system of examination of output sheets from local computers, which has considerable merit. Both offices continue to send in their more-complicated, large-type subdivision plans. The number of plans received and checked due to the above problem was reduced to 1,719.

To aid in checking the smaller plans still being received, a desk-model programmable electronic computer was purchased and has proven to be a valuable tool in replacing man-hours with machine-minutes.

Reproductions

The Reproduction Section continues to supply the greater proportion of its service to other departments and the public. Of the total of 302,417 diazo prints made, only 40 per cent were for the Department of Lands, Forests, and Water Resources. Of the total of 167,123 photographic prints made, 90 per cent was work for other departments. The offset press turned out 1,730,066 sheets, up approximately 27,000 from the previous year, and has been a valuable tool in the printing of the *General Survey Instructions,* circular letters governing new procedures under new statutes, subdivision regulations, etc. The Xerox equipment output was up 24,000 prints to 325,674.

(3) FIELD WORK

The Legal Surveys field programme is made up from the various surveys required to be undertaken as a result of requests received mainly prior to the field season. While the majority of the work is done on behalf of the Lands Branch, numerous other Government departments are accommodated, as evidenced by the following review of the 1970 programme. The work is assigned and normally carried out during the months of May to November, when weather in most areas of the Province dictates that it is otherwise inefficient if not impossible to operate.

The field staff presently consists of seven surveyors, one of whom rejoined the service in mid-November, and eight permanent field assistants. The addition of hired summer help allows for an individual survey crew of from three to five men, including the surveyor.

Acreage and Subdivision Surveys, Lands Branch

Considerable survey activity centred in the Fort Nelson area, where for some time two surveyors and crews were deployed. In continuation of a scheme initiated in 1969 to make available large areas for lease, 18 lots were created, covering approximately 6,000 acres in the vicinity of Mile 295 of the Alaska Highway. North of the settlement, on the Fort Simpson trail, 14 roadside lots were posted, and in Fort Nelson a resubdivision was carried out to make available 61 lots in an area now serviced by water. At Alert Bay, 90 acres of land obtained through exchange were surveyed, to be used for airport purposes. A 550-acre parcel also obtained through exchange with a timber company was surveyed into two lots at Roberts Creek. Right-of-way surveys were conducted to provide additionally required width for cuts and fills on roads through Crown subdivisions at Clinton and Apex Mountain. A small subdivision in the Village of Cumberland created three lots, and south of Nanaimo a posting and subdivision were necessary to accommodate an owner whose house was found to occupy the adjoining Crown lot. A dump-site was surveyed in the Paul Lake area, and a small parcel in the University Endowment Lands was surveyed to effect conveyance.

Waterfront Lease Lots

Green Lake	113
Summit Lake	39
Total	152

Rural Roadside Lots

Fort Nelson	14
Westbank	12
Galloway	17
Purden Lake	26
Fort St. James	27
Cranbrook	19
Total	115

Reposting and Restoration

In the Townsite of Balfour, several blocks were redefined and subdivided to conform to minimum area requirements, creating 30 lots. A 1-chain wide Crown reserve was posted through Lots 134 and 137 at Long Beach. In the precinct of the Victoria Government Buildings, six areas were posted for parking-lot use, and the property occupied by Helmcken House was redefined on the ground for the Department of Public Works. The boundaries of the Forest Museum at Duncan were reposted for the Forest Service; also part of the boundaries of the Red Rock tree nursery. A posting of partial boundaries of a lot in Malahat District was done to replace corners destroyed by road construction.

A total of 112 district lot corners, including those tied to in highway surveys, were renewed with permanent-type monuments.

Interdepartmental Surveys

Surveys undertaken during the 1970 season for departments of the Government other than the Lands Branch were as follows:

Parks Branch—Postings of parts of the boundaries of Bowron Lake Park, Moyie Lake Park, Mount Robson Park, and Mount Seymour Park were completed. On the west shore of Christina Lake an area of 157 acres was divided into two lots in order that the Crown might acquire title to 120 acres donated for park purposes. A small but desirable donated area fronting Fulford Harbour was surveyed as an addition to an area previously given by the same donor. A lot was surveyed adjoining the Village of Burns Lake for public recreational use.

Forest Service—In addition to reposting work referred to under that heading, a survey was required to prepare a certificate of nonencroachment at Williams Lake, and at Red Rock a subdivision was undertaken to consolidate part of the existing nursery lands with a newly acquired parcel.

Water Rights Branch—A right-of-way for drainage-ditch purposes was surveyed in Lot 2450(S), and a 12.5-acre parcel was created in the vicinity of Oliver for the irrigation district.

Department of Public Works—In the City of Prince George, a resubdivision of a city block into two parcels was made, and at the British Columbia Institute of Technology a survey was necessary to permit the issuance of a lease.

Department of Highways—An extensive start was made on the surveys of private ownership along the Kootenay River being flooded by the Libby Dam construction. The survey of nine priority lots was completed before winter weather forced postponement of this major assignment.

An area of possible accretion was surveyed adjoining private ownership fronting Canoe Pass in the vicinity of Ladner.

Highway Surveys

Again this year, only two survey crews were assigned to this work. Eight and one-tenth miles of the Yellowhead Highway were completed in the vicinity of McBride, and 13 miles of the North Thompson Highway between Blue River and Valemount.

Miscellaneous Surveys

A survey was required to produce a plan of the improvements in the area of the upland end of the Tsawwassen causeway.

The natural boundary and extent of fill fronting a parcel in Metchosin was determined and, in the False Creek area, two upland parcels were surveyed and two fronting areas of foreshore were defined.

In the vicinity of Egmont, a survey was necessary to correctly determine the position of an existing mineral claim relative to the boundaries of district lots in the area.

TOPOGRAPHIC DIVISION

A. G. SLOCOMB, B.C.L.S., CHIEF

The past decade was a most successful one for the Topographic Division, much was accomplished, new methods devised, and new equipment purchased. Our personnel have remained fairly constant over the period in total, but considerable change was evident in individuals, particularly our instrument men and surveyors. We still have 25 that have remained over the full period, most of whom are now long-service employees and form the nucleus of the Division.

Integrated survey, commenced in 1962, is an example of a new method. There are now four integrated survey areas declared and gazetted under the *Official Surveys Act,* and others are in varying stages of completion. Several larger cities have declared an intent to proceed as soon as funds can be made available to install the monuments required.

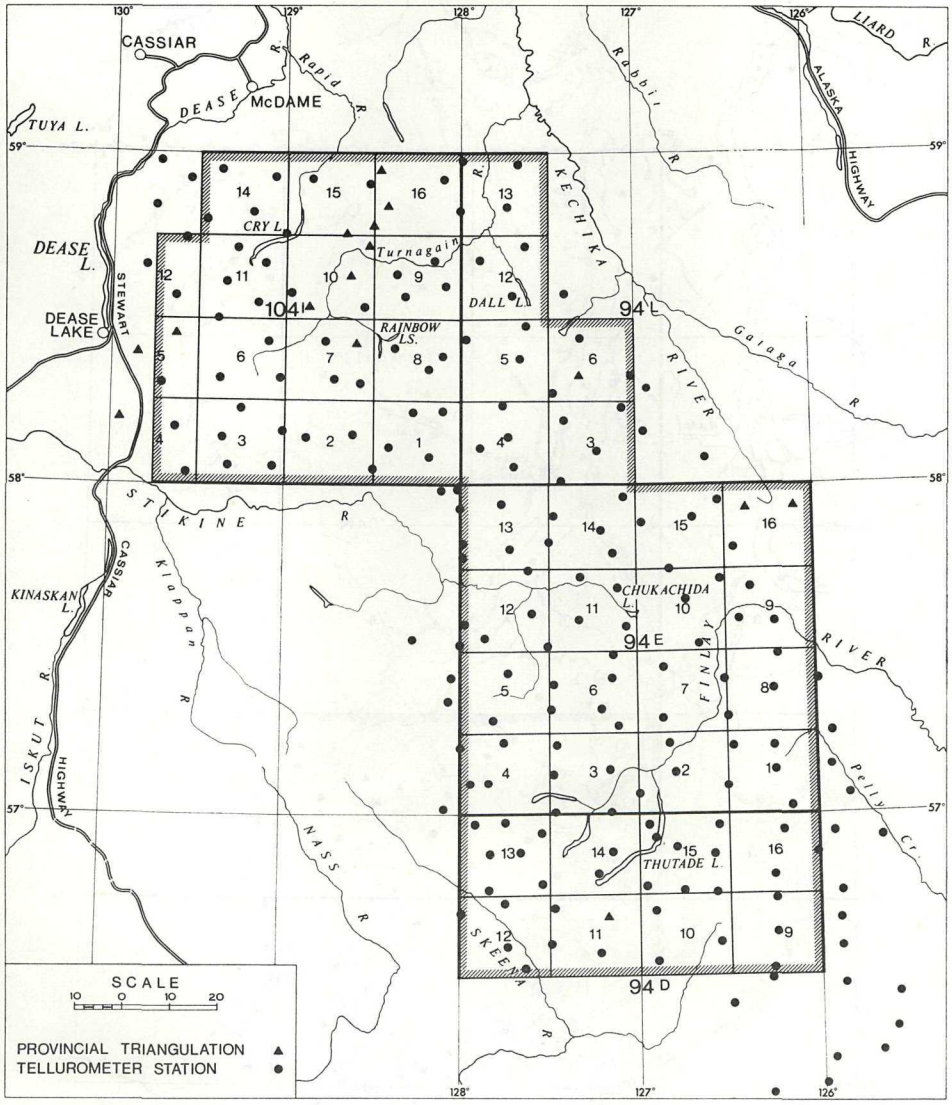
The original purpose of this Division, the production of the National Topographic Series 1:50,000 map-sheets, was not neglected, although curtailed by more pressing needs for control. One hundred and ninety-two map-sheets over 10 years is a respectable average, but emphasis on the current year's production of 50 map-sheets, an all-time high, indicates we had other diversions. Special surveys, pondage, triangulation, site plans, and integrated survey allowed our staff the opportunity to show their versatility. They completed 75 separate large-scale projects, worked in 29 integrated survey areas, as well as the standard mapping control.

Our equipment has been updated as often as possible, either by the latest models or improvement, in the case of the Kelsh plotters, by stereo alternators. When we are successful in acquiring a second-order plotter we should be able to carry on until automation is perfected and we can change over to that. It should not be too far in the future, possibly the next decade.

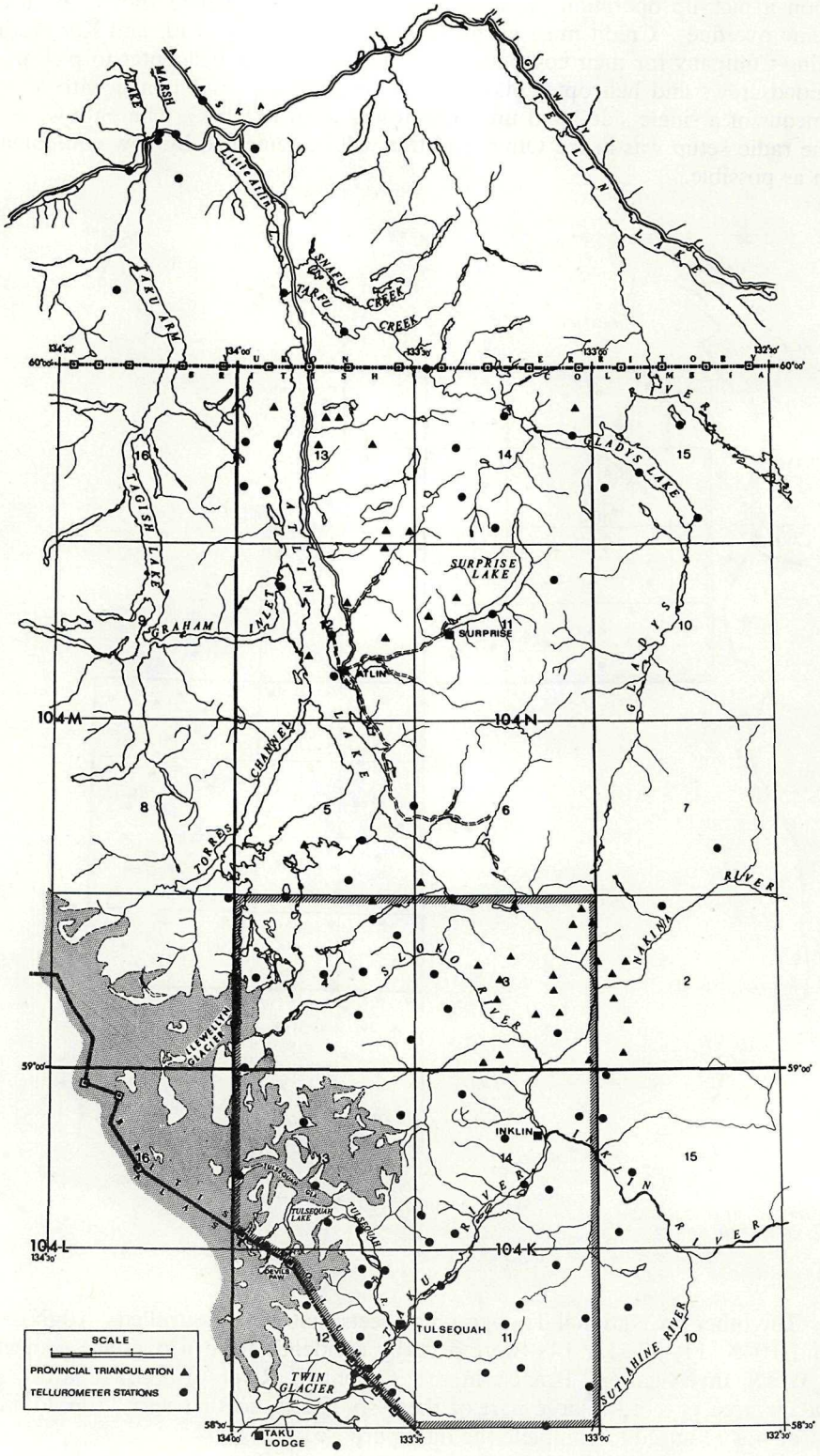
The largest crew this past season was our air-borne operation supported by one helicopter, a Bell G3B1, chartered from Liftair International of Calgary, and the Department's De Havilland Otter. This was a start of a control survey in north central British Columbia that is expected to take three years to complete and is being done in conjunction with a resources inventory in the same area. The topography of the country ranges from rugged broken peaks to rounded hills and alpine meadows, thus supplying a variety of challenges to the helicopter pilot and survey crews. The region is one of the most remote in the Province from the point of view of access to highways and other major sources of supply, and taxed our support aircraft and supply lines to the limit. The area covered this summer extended from Dease Lake south and east to Thutade Lake, and covered map-sheets 104 I, the western portion of 94 L to the Rocky Mountain trench, 94 E, and the north half of 94 C, in all, 44 National Topographic sheets. The Otter logged 362 hours on the job, and was struggling to keep up most of the summer. One contributing factor to this was that our engineer quit in late June, but due to employment restrictions could not be replaced, leaving the machine without an engineer. All the remaining service checks and maintenance work had to be done in town (Watson Lake or Smithers) either by engineers available locally or flown up from Victoria to do the job.

Radio was again very important and worked well. The traverse crews maintained contact with each other and the helicopter by FM portables and to base camp through our remote portable repeater station, which again proved its worth on more than one occasion, and particularly so when the helicopter was forced down due to a blower failure. The field crews were able to contact base camp to set in

motion a pick-up operation far in advance of the normal time should an aircraft become overdue. Credit must go to Transwest Helicopters Ltd. and Ker Addison Mining Company for their co-operation in the use of their helicopter to pick up the stranded crews and helicopter pilot. Radio contact was maintained with Victoria by means of a single side-band unit, which was most reliable. The only weak link in the radio setup was in the Otter, and this will be remedied by new equipment as soon as possible.



The other six National Topographic sheets that were controlled—104N/3 and 4 and 104K/11, 12, 13, 14—were actually dividends from a pondage project for the Water Investigations Branch in the Tulsequah River-Atlin Lake area. The pondage area covered a large part of these six sheets, so that very little additional control was required to complete the dual purpose.


MARSH LAKE
LITTLE ATLIN LAKE
SMALL ON TARPU CREEK
TAKU ARM
TAGISH LAKE
GRAHAM INLET
ATLIN LAKE
CHANNEL
TORRES
SURPRISE LAKE
SURPRISE
ATLIN
GLADYS LAKE
GLADYS RIVER
NAKLIN RIVER
SLOKO RIVER
LLEWELLYN GLACIER
INKLIN
INKLIN RIVER
TULSEQUAH LAKE
TULSEQUAH
TULSEQUAH RIVER
TAKU RIVER
SUTLAHINE RIVER
TWIN GLACIER
TAKU LODGE
104-M
104-N
104-L
104-K
SCALE
PROVINCIAL TRIANGULATION
TELLUROMETER STATIONS

This is one of the most rugged sections of the Province, with many glaciers and high, rugged peaks, so that the weather also was a factor to be contended with. Due to low water in the later part of July, our Otter aircraft could not land on the Taku River. A chartered DC3 had to use an unused airstrip 4 miles from the abandoned mining community of Tulsequah. The crew had obtained permission to use the vacant buildings at the Polaris mine. After getting into position to work, the rains came and hampered the operation for the next 12 days, then for the next 15 days low clouds and continuous rain stopped all work. During this time they experienced two floods, known as jökulhaup, or glacial outburst. At the peak there was 32 inches of silt-laden, icy, running water in front of the building they were staying in. It was most fortunate that they were in the buildings and not in tents.

The Tulsequah River gave fair warning, rising about 2 inches an hour for three to four days. It was far more rapid in recession. On the 17th of August, after peaking, the water dropped 14 inches in the hour. From start to finish a flood takes from four to five days.

The known source of this flood is Tulsequah Lake, 3 miles long by one-half mile wide, which occupies a steep-walled basin between Tulsequah Glacier and a glacier headed on Devils Paw peak. The lake is known to have drained for over 60 years and to have drained at least once annually since 1942. Due to the heavy rains, our crew witnessed it twice, a week apart. One theory is that the basin refills to nine-tenths of the height of the impounding ice wall. At this time the lake water floats the barrier and the forward edge of the glacier collapses. It is believed immediately prior to this collapse at the "critical point," where the ice of the main glacier is on bedrock, the ice is lifted momentarily, and slightly, but sufficiently to change the water in the lake from a hydrostatic state to a hydrodynamic force, so that the released water gushes under and reopens routes through the ice.

The extension of control throughout that part of the District of North Cowichan lying north of Herd Road was the major project for the year for the integrated survey crew. For the first time the crew did monumentation, secondary control, and street-traversing simultaneously, and it worked out very well for there were no overlaps.

While our principal concern is determining the position of the monuments, the municipal offices are more interested in elevation data. Over the years we have endeavoured to upgrade our procedures. This year, all of our level work was done with rods containing graduated invar strips, and for the first time a recently purchased parallel plate-type micrometer for the Zeiss Ni 2 instrument was used on primary level lines connecting geodetic bench marks. The results were excellent and use of this equipment will be continued.

A system of monuments for an integrated survey was designed and marked on the ground for the City of Fort St. John and also for the City of Penticton. Monuments of the City of New Westminster special survey, which have been included in our control survey, were stamped with identifying numbers and reference sketches were made of New Westminster and Delta monuments.

Integrated Survey Area No. 4 was declared in July, situated in the Yale Land District, comprising a portion of the City of Kelowna.

Monuments were set along each side of the main stream of the Fraser River between the mouth of the Sumas River and the Rosedale Bridge. They were installed at the request of the Department of Municipal Affairs and are intended to reference a proposed conventionalized boundary between the District of Kent to the north and the District of Chilliwhack to the south. These 31 monuments were tied in by three second-order control stations to first-order "Bear" and "Mill" by

MRA3 tellurometers and Wild T3 theodolites. A geodimeter traverse connected the monuments, and levels were carried from geodetic bench marks at each end by differential levels. Elevation of the monuments along the river traverse are derived from vertical angles.

Thirteen separate projects, one for the Fish and Wildlife Branch and the remainder for the Department of Public Works, were mainly of site plans, with several topographic, profile, and cross-section for planning purposes. The locations were scattered from Fort St. John to Wardner and Tête Jaune to Nanaimo and the Lower Mainland. One crew did nine, spending all year on them, while the Atlin crew took care of three before they went north. The other was done by an integrated survey party.

Forty half-sheets plus eight partial sheets of the National Topographic Series, totalling approximately 7,314 square miles, were compiled in the Photogrammetric Section. In addition, 15 more were prepared for early 1971.

Bridging was completed in the 104H Block; two previously mapped half-sheets were included that will require revision.

There were 26 large-scale projects ranging in scale from 50 to 1,320 feet to 1 inch, totalling 1,326 square miles. The projects consist of nine for the Water Resources Service, six for the Department of Highways, five for the Department of Lands, four for the Forest Engineering Service, one for the Department of Mines and Petroleum Resources, and one for the Parks Branch. Three others being worked on—two for Water Resources and one for Fish and Wildlife—are almost completed. The completed portion was included in the above total.

Two stereo alternator systems with 12-volt conversion units were installed on our Kelsh plotters. The improved light and the stereo system have reduced operator eye-strain and increased production due to the fact that the majority of the detail interpretation is now possible directly in the model.

A plotterscope attachment for the Wild A-7 co-ordinatograph has also proved its worth. It enabled an increased amount of spot-heighting produced this year to be handled by one man.

We are presently testing a stereo alternator system with quartz-hologen lamps on one of our multiplex plotters. This system was loaned to us for the test by the Bausch and Lomb Company.

The use of ortho-photos continues to be evaluated. Samples of their product were received from the Raytheon Company and from Hobrough Ltd., both of which use the cathode-ray tube system. An offer from Zeiss Jena to install equipment on our premises for evaluation did not take place due to an electrical problem. They hope to be able to set up during early 1971, after which a full report will be made.

The Draughting Section reports the compilation of five standard topographic manuscripts at the scale of 2 inches to 1 mile.

One hundred and thirty-six large-scale mapping plans at various scales were completed, as well as the plotting of cadastral surveys on 14 Federal Government 1:50,000-scale manuscripts.

One integrated survey plan covering the City of Kelowna was completed. One mosaic was constructed.

The Federal Government now has 154 of our 1:50,000-scale manuscripts on hand for printing, which are in various stages of reproduction.

Worthy of mention are the McBride project, made up of 24 sheets at the scale of 200 feet to the inch, covering McBride and the surrounding area; the Highland Valley project, drawn at the scale of 1,320 feet to 1 inch, containing 28 sheets and showing the cadastral information thereon (it extends from Merritt to Ashcroft);

the Unuk River drawn at the same scale containing 12 sheets, and which will later be reduced and used to construct maps 104B/7 and B/10.

To keep abreast of the times the Draughting Section has made considerable use of the Calcomp plotter at the Provincial Computer Centre to automatically plot control stations. They are also in the process of changing over to scribing, and at present three of the staff are performing graphic scribe technology, a new one-step technique for producing a composite positive from a scribed original with positive art.

Our new policy of plotting cadastral information on all large-scale mapping is very time-consuming, with a resulting reduction in production.

Copies of the photogrammetric large-scale mapping listed on the pages following this report are available on request. The reader is also referred to the indexes contained in the envelope attached to the back cover of this Annual Report.

Large-scale Mapping

No.	Name	Scale	Contour Interval	No. of Sheets	Completion Date
S.P. 1	Richmond	1″=200′, 600′	Mosaic	—	—
S.P. 2	Lower Fraser Valley	1″=1,000′	5′ to 50′, then 50′	18	1957
S.P. 3	Lower Fraser Valley	1″=1,000′	5′ to 50′, then 50′	20	1958
E.P. 5	Lawless Creek	1″=10 ch.	50′	13	1951
E.P. 8	Moran Dam-site	1″= 100′	5′	1	1951–52
E.P. 9	Salmo	1″=1,000′	50′	38	1952
E.P. 10	Moran Pondage	1″= 500′	20′–40′	8	1952
E.P. 14	Fraser Pondage	1″= 500′	10′–20′	6	1951
E.P. 15	Fraser Pondage	1″= 500′	20′–40′	13	1953
E.P. 17	Agassiz	1″= 200′	5′	28	1953
E.P. 18	Delta Municipality	1″= 200′	Spot heights	73	1953–54
E.P. 19	Doukhobor lands—				
	Grand Forks	1″= 400′	5′–10′–25′	2	1953–54
	Krestova-Raspberry, etc.	1″= 400′	5′–10′–25′	7	1953–54
	Krestova Revision	1″= 400′	Planimetric	1	1963
E.P. 21	Agassiz (Extension)	1″= 400′	20′–100′	(1)	1954
E.P. 24	Moran Pondage	1″= 500′	20′–40′	11	—
E.P. 28	Clearwater	1″= 500′	20′–40′	12	—
M2	Morice Lake	1″=1,000′	50′	8	1954–55
M3	Naver Creek	1″=1,320′	50′	6	1955
M4	Chilcotin River	1″= 500′	20′–40′	6	1955
M5	Gaspard Creek	1″= 500′	20′–40′	1	1955
M6	Churn Creek	1″= 500′	20′–40′	1	1955
M7	Willow River	1″=1,320′	50′	26	1955–56
M8	Upper McGregor River	1″=1,000′	20′	3	1956
M9	Sinclair Mills	1″= 500′	20′	48	1956–62
M11	Hobson Lake	1″=1,000′	50′	8	1955
M12	Moran-Lytton	1″= 500′	20′–40′	23	1955
M13	Penticton-Osoyoos	1″= 500′	10′	11	1954
M14	Kelowna	1″= 500′	10′	5	1954
M15	Westbank	1″= 500′	10′	2	1954
M16	Lower McGregor River	1″=1,000′	20′	7	1956
M17	Creston	1″= 500′	5′–10′–15′	6	1954
M21	Clearwater	1″= 500′	20′–40′	20	1955
M24	San Jose	1″= 500′	10′	8	1956
M27	Peace River Pondage	1″=1,000′	20′	11	1958
M29	Naramata	1″= 400′	10′	2	1956
M30	Goat River	1″= 200′	Planimetric	4	1956
M34	Fruitvale	1″= 500′	10′–20′	2	1957
M36	Moose River	1″=1,000′	20′–40′	4	1957
M37	Mount Robson	1″=1,000′	20′–40′	5	1956–57
M38	McLennan River	1″=1,000′	20′–40′	3	1956–57
M39 (1957)	Dease River Dam-sites	1″= 500′	20′	9	1956–57
M39 (1958)	Dease Stikine Dam-sites	1″= 500′	10′	16	1959
M39 (1960)	Dease Stikine Dam-sites	1″= 500′	10′–20′	40	1960
M40	Chilliwack River	1″= 600′	20′	7	1956

[1] *See* Map E.P. 17.

LARGE-SCALE MAPPING—*Continued*

No.	Name	Scale	Contour Interval	No. of Sheets	Completion Date
M41	Summit Lake (Diversion)	1″=1,000′	20′	3	1959
M42	Peace River Dam-site	1″= 600′	20′	10	1957
M44	Prince George East	1″= 200′	5′	2	1958
M45	Prince George West	1″= 200′	5′	8	1958
M52	Kaslo	1″= 500′	50′	17	1959–60
M54	Big Bar	1″=2,640′	100′	1	1957
M56	Lac la Hache	1″= 500′	20′	10	1958
M59	Eaglet Lake	1″=1,320′	20′	2	1958
M62	Alberni	1″= 500′	10′	2	1958
M63	Parsnip River Pondage	1″=1,320′	20′ to 2,600′, then 50′	98	1958–59–61–62–63
M63A	Parsnip River Pondage (Addition)	1″=1,000′	20′	5	1962
M66	Glen Lake	1″= 400′	10′	10	1958
M67	Chemainus River	1″= 400′	10′	4	1958
M68	Hansard Lake	1″=1,320′	20′	3	1958
M70	Courtenay-Comox	1″=1,320′	25′ to 600′, then 500′ to 2,000′, then 100′	10	1958
M73	North Okanagan	1″=1,000′	20′	48	1959
M73	North Okanagan	1″= 500′	10′	5	1959
M74	Glinz Lake	1″= 200′	10′	1	1959
M75	Duncan	1″= 500′	10′ and 20′	25	1959
M76	Nanaimo	1″= 500′	10′ and 20′	20	1960
M77	Prince George	1″=1,000′	20′	17	1960–61
M88	South Okanagan	1″= 500′	10′ and 20′	11	1963
M88	South Okanagan	1″=1,000′	20′	5	1964–65
M89	North Thompson	1″= 300′	5′	5	1960
M89	North Thompson	1″= 500′	20′	15	1960
M90	Similkameen	1″= 200′	5′	9	1961
M90A	Similkameen	1″= 200′	5′	19	1965
M90B	Similkameen	1″= 200′	5′	24	1966–67
M92	Skeena River	1″= 500′	20′	11	1962
M98	Aberdeen-Haddo Lake	1″= 500′	10′	4	1960
M105	Clearwater Lake-Azure Lake	1″=1,000′	50′	6	1962
M107	Campbell River	1″=1,000′	20′	5	1961
M108	Kootenay River	1″= 500′	Planimetric	12	1961
M109	London Mountain (Whistler Mountain)	1″= 200′	20′	3	1961
M111	Clearwater River Dam-site	1″= 250′	5′	4	1961
M113	Nanaimo	1″= 500′	5′–10′	8	1963
M117	Liard River	1″=1,000′	20′	68	1962
M117	Liard River Dam-site	1″= 500′	10′	7	1962
M117A	Liard River	1″= 500′	10′	1	1966
M118	Nitinat	1″= 500′	10′ and 20′	7	1962
M121	Winfield	1″= 500′	10′ and 20′	4	1961
M122	Stuart Lake Pondage	1″=1,320′	20′	9	1962
M125	Port Hardy	1″= 100′	2′ and 4′	4	1962
M126	Thompson River	1″= 200′	10′–20′	3	1962
M127	Parksville	1″= 200′	10′	4	1965
M129	Aleza Lake	1″= 40′	2′	1	1962
M130	McGregor River Pondage	1″=1,000′	20′	6	1962
M131	Long Lake	1″=1,320′	50′–100′	4	1962
M134	Kamloops Lake	1″=1,000′	20′	4	1962
M135	Quesnel	1″= 500′	10′	7	1963–65
M136	Haney	1″= 500′	25′	2	1962
M138	Hobson Lake (Extension)	1″=1,000′	50′	2	1962
M139	Norbury Creek	1″= 400′	10′	1	1962
M142	Kaleden	1″= 500′	10′	1	1963
M144	Marysville	1″=1,000′	25′ and 50′	1	1963
M151	Prospect Lake	1″= 200′	2′	1	1963
M152	Ruby Burn	1″= 200′	5′	1	1963
M155	Sechelt	1″= 500′	20′–50′	23	1964
M158	Parksville building-site	1″= 600′	20′	1	1964
M160	Ladysmith	1″= 600′	20′	1	1964
M161	Hudson Bay Mountain	1″=1,000′	50′	8	1964
*M162	Haney Bypass	1″= 100′	2′ and 5′	24	1964
M163	Slesse Creek Bridge	1″= 300′	5′ and 20′	1	1964
M164	Saanich garbage disposal	1″= 200′	5′	1	1964
M168	Peace River Pondage (Finlay River)	1″=1,320′	25′ to 2500′, then 50′	31	1965
M170	Gibson Pass	1″=1,000′	25′–50′	3	1965, 1966
M171	Black Tusk Meadows	1″= 200′	5′	2	1965

* Restricted distribution.

LARGE-SCALE MAPPING—*Continued*

No.	Name	Scale	Contour Interval	No. of Sheets	Completion Date
M171	Black Tusk Meadows	1″= 500′	10′	1	1965
M172	Chilcotin Road	1″= 100′	5′	9	1965
M172	Chilcotin Road	1″= 200′	10′	4	1965–66
M173	Copeland Mountain	1″=1,000′	50′	4	1965
M175	Shuswap Canal (Diversion)	1″= 200′	5′	10	1965–66
M176	Stewart	1″=1,320′	100′	2	1965
M178	Sparwood	1″= 200′	5′ and spot heights	3	1965
M179	Niskonlith	1″= 400′	50′	1	1965
M180	Colwood-Langford	1″= 200′	5′	27	1967
M181	Nematode	1″= 200′	5′	1	1965
M182 (1968)	Stikine-Iskut Pondage	1″=1,000′	20′	21	1968
M182	Stikine-Iskut Dam-sites	1″= 200′	10′	6	1965
M182	Stikine-Iskut Pondage	1″=1,000′	20′–100′	53	1965–66
M186	Revelstoke	1″= 100′	2′	4	1966
M188	Otter Lake	1″= 200′	5′	4	1966
M189	Shuswap Okanagan	1″= 200′	5′ and spot heights	3	1966
M196	Keremeos	1″= 200′	5′	2	1966
*M197	Hurley Pass	1″= 400′	25′	5	1966–67
M198	Peachland	1″= 500′	10′	3	1966
M200	Merritt	1″= 200′	2′	6	1967
M201	Archæology	1″= 100′	5′	1	1966
M202	South Revelstoke	1″= 100′	2′	5	1966–67
M204	Prince George West	1″= 200′	10′	9	1967
M205	Nelson-Liard Pondage	1″=1,000′	20′	31	1968
M210	Kechika	1″=1,000′	20′	28	1967
M215	Anyox-Portland Canal	1″=1,320′	25′	7	1967–68
M216	Black Mountain Irrigation District	1″= 500′	20′	1	1967
M217	False Narrows	1″= 100′	20–100 cm.	1	1967
M218	Hells Gate	1″= 50′	5′	1	1967
M218	Hells Gate	1″= 200′	50′	1	1967
*M220	Floods-Hope	1″= 100′	5′	9	1968
*M222	Sayward-Beaver Cove	1″= 400′	20′	24	1968
M226	Salmon River	1″= 500′	10′	9	1968
M228	Portage Inlet	1″= 16′	2′	1	1967
M228	Portage Inlet	1″= 50′	2′	1	1967
M229	Rossland	1″=1,000′	50′	3	1970
M230	Peace River Dam-sites, C. and E.	1″= 200′	5′	16	1968
M232	Squamish	1″= 200′	5′	17	1969
M233	Jordan River	1″= 600′	20′	3	1968
M233	Jordan River	1″= 100′	5′	3	1968
M234	Gulf Islands	1″=1,320′	25′	12	1969
M236	Copper Mountain	1″=1,320′	50′	2	1968
M237	Mission Creek	1″= 100′	2′	1	1968
M238	Mission Creek	1″= 500′	20′	1	1968
M238	Mission Creek	1″= 200′	10′	1	1968
M242A	Unuk River	1″=1,320′	100′	12	1970
M243	Sugar Lake outlet	1″= 400′	10′	2	1968
†M245	Saanich Peninsula	1″= 400′	10′		
*M246	Chilanko Forks	1″= 400′	10′	20	1970–71
M249A	Wardner	1″= 100′	2′	2	1969
M249	Libby Pondage	1″= 200′	5′	63	1969
M250	The Woodlands School	1″= 40′	2′	4	1969
*M251	Hope-Merritt	1″= 400′	5′	32	1970
*M256	Flood-Hope (Addition)	1″= 100′	5′	2	1969
*M256A	Flood-Hope (Addition)	1″= 100′	5′	3	1969
M259	Cowichan Valley Forest Museum	1″= 100′	5′	1	1969
M260	Highland Valley	1″=1,320′	50′	28	1970
M262	McBride	1″= 200′	10′	24	1970
M263	Alta Lake	1″= 500′	10′ and 20′	7	1970
M266	Mara Lake	1″=1,000′	20′ and 100′	1	1969
M269	Liard River	1″=1,000′	20′	1	1969
†M270	Dease River	1″=1,000′	20′	7	
M273	Forbidden Plateau	1″=1,320′	25′	1	1970
*M283	Vancouver-Whistler Mountain	1″= 400′	20′	6	1970
†M287	Slocan Valley	1″= 500′	5′		
†M291	Wardner	1″= 50′	1′		
†M293	Watson Lake	1″=1,000′	20′		
†M297	Atlin	1″=1,000′	20′ and 100′		
†M298A	Taku	1″=1,000′	20′ and 100′		

* Restricted distribution.
† In course of compilation.

British Columbia Topographic Map-sheets Showing Dates of Field Surveys

Sheet	Date
82 F/3	1951, 1954
F/4	1944, 1947
K/11 W.	1952
K/12	1952
L/7	1958
L/10	1958
M/13	1959
83 D/4	1959
D/5	1959
D/12	1959, 1960
D/13 W.	1960
92 B/5	1937, 1938, 1956, 1963
B/6 W.	1956
B/11 W.	1956
B/12	1938, 1956, 1963
B/13*	1942, 1943, 1951, 1963, 1965
B/14*	1951
C/8*	1937, 1938, 1963
C/9*	1937, 1938, 1963
C/10*	1937, 1938, 1963
C/11 E.*	1938, 1963
C/13 E.	1938
C/14	1938
C/14 E., part*	1965
C/15*	1937, 1938, 1965
C/16*	1938, 1942, 1951, 1963, 1965
E/1 E.	1942
E/7 E.	1946
E/8	1943, 1946
E/9	1938, 1947
E/10	1947
E/14	1948
E/16	1947
F/1*	1942, 1943, 1965
F/2*	1938, 1940, 1942, 1963, 1965
F/3	1938, 1940, 1941
F/4	1942
F/5	1937, 1938, 1943
F/6	1938, 1940, 1941
F/7*	1940, 1941, 1942, 1965
F/8*	1942, 1943, 1950, 1965
F/9	1950
F/10	1950, 1953
F/11	1934, 1935, 1937, 1938
F/12	1936, 1937, 1938
F/13	1935, 1936
F/14	1935
F/15 E., part	1950
F/16 E., part	1950
G/4*	1942, 1943, 1965
G/5	1950, 1952
G/7, part	1940
G/10, part	1940
F/8	1942, 1943, 1950
G/11	1952
G/12	1950, 1952
G/13	1950, 1952
G/14	1952
H/1	1920, 1923, 1950
H/2	1923, 1949
H/3	1924, 1931, 1948, 1949
H/4	1948
I/12	1958
I/13	1958
J/15	1948, 1949
J/16	1948, 1949
K/1E., part	1950
K/3	1949
K/4	1949
K/5	1949
K/6	1949
L/1	1932
L/2	1931, 1932
L/3	1948
L/4	1948
L/6	1931, 1934, 1940
92 L/7	1931, 1932
L/8	1931, 1932
L/10	1931, 1940, 1956
L/11	1940
L/12	1935, 1936
L/13	1936
M/3	1959
M/4	1959
M/5	1959
N/1	1958
N/7	1958
N/8	1958
N/9	1958
N/10	1958
N/15	1958
O/1	1950
O/2	1947
O/3	1958
O/4	1958
O/5	1958
O/6	1958
O/7	1950, 1958
O/8	1950
O/9	1951
O/10	1958
O/11	1958
O/12	1958
O/16	1951
P/2	1959
P/3	1959
P/4	1958
P/5	1958
P/6	1959
P/7	1959
P/10	1959
P/11	1959
P/12	1958
P/13	1958
P/14	1959
P/15	1959
P/16	1959
93 A/1	1959
A/2	1936, 1959, 1960
A/3	1959, 1960
A/4	1959
A/5	1935
A/6	1935
A/7	1936, 1959, 1960
A/8	1959
A/9	1959, 1960
A/10	1934, 1960
A/11	1933, 1934
A/12	1931, 1933, 1934
A/13	1934
A/14	1933, 1934
A/15	1934, 1960
A/16	1960
B/1	1951
B/6*	1963
B/7*	1963
B/8	1952
B/9	1950, 1965
B/10*	1963
B/11*	1963
B/12*	1963
B/13*	1963
B/14*	1963
B/15*	1963
B/16	1950, 1965
C/5	1959
D/7 E.	1958
D/8	1958, 1959
G/2	1933, 1960
G/3	1960
G/4	1960
G/5	1960

* Compilation in process.
† Field survey completed.

British Columbia Topographic Map-sheets Showing Dates of Field Surveys—*Continued*

Sheet	Date
93 G/6	1960
G/7	1933, 1960
G/10	1960
G/11	1960
G/12	1960
G/14	1948
I/8	1956
I/9	1956
I/10	1956
I/11	1957
I/12	1957
I/13	1957
I/14	1957
I/15	1956
I/16	1956
J/2	1949
J/3	1949
J/5	1961
J/6	1961
J/11	1961
J/12	1961
J/13	1961
K/1	1946
K/2	1946
K/7	1930, 1960
K/8	1930, 1960
K/9	1960
K/10	1960
K/11	1961
K/12	1961
K/13	1961
K/14	1961
K/15	1961
K/16	1961
L/2	1951
L/7	1951
L/9	1951
L/10	1950, 1951
L/11	1950
L/14	1950
L/15	1962
L/16	1962
M/1	1962
M/2	1963
M/5	1949
M/7	1963
M/8	1963
M/9	1963
M/10	1963
M/11	1963
M/12	1949
M/13*	1963
M/14*	1963
M/15*	1963
M/16*	1963
N/1*	1962
N/2*	1962
N/3*	1962
N/4*	1962
N/5*	1962
N/6*	1962
N/7*	1962
N/8*	1962
N/9*	1962
N/10*	1962
N/11*	1962
N/12*	1962
O/1	1957
O/4*	1961
O/5*	1961
O/6	1957
O/8	1957
O/11	1957
O/12	1957
93 O/13	1957
O/14	1957
P/1	1956
P/2	1956
P/3	1957
P/4	1957
P/5	1957
P/6	1957
P/7	1956
P/8	1956
94 B/4	1939, 1957
C, part	1939
D/1†	1963
D/2†	1963
D/3†	1963
D/4†	1963
D/5†	1963
D/6†	1963
D/7†	1963
D/8†	1963
D/9†	1970
D/10†	1970
D/11†	1970
D/12†	1970
D/13†	1970
D/14†	1970
D/15†	1970
D/16†	1970
E/1†	1970
E/2†	1970
E/3†	1970
E/4†	1970
E/5†	1970
E/6†	1970
E/7†	1970
E/8†	1970
E/9†	1939, 1970
E/10†	1970
E/11†	1970
E/12†	1970
E/13†	1970
E/14†	1970
E/15†	1970
E/16†	1939, 1970
F, part	1939
L/3†	1970
L/4†	1970
L/5†	1970
L/6†	1970
L/12†	1970
L/13†	1970
L, part	1940, 1941
M, part	1941
102 I/8 E.	1935, 1937
I/9	1935, 1936, 1937
I/15	1937
I/16	1936, 1937
P/8 E.	1961
P/9 E.	1961
P/16	1961
103 A/1	1961
A/2 E.	1961
A/8	1961
A/9	1961
A/13 E.	1961
G/1 E.	1961
G/7 E.	1961
G/8	1961
G/9	1961
G/10 E.	1961
G/15 E.	1961
G/16	1961
H/3	1961
H/4	1961

* Compilation in process.
† Field survey completed.

British Columbia Topographic Map-sheets Showing Dates of Field Surveys—*Continued*

Sheet	Date
103 H/5	1961
H/6	1961
I/2	1949
I/7	1948
I/10	1947
P/9	1949
P/10 E.	1950
P/14 E.	1950
P/15	1950
P/16*	1967
104 A/1*	1967
A/2 E.*	1967
A/2 W.	1950
A/3	1950
A/4†	1967
A/5 E.	1950
A/5 W.†	1967
A/6	1950
A/7*	1967
A/8*	1967
A/10*	1967
A/11 E.*	1967
A/11 W.	1951
A/12	1951
A/13 E.*	1967
A/13 W.	1951
A/14*	1967
A/15*	1967
104 B/1†	1967
B/6 E.*	1967
B/7*	1967
B/8†	1967
B/9†	1967
B/10*	1967
B/11*	1967
B/12 E.*	1966, 1967
B/13 E.*	1965, 1966
B/14*	1965
B/15*	1965
B/16	1951
F/16	1967
G/1	1951, 1969
G/2*	1965
G/3*	1965
G/4 E.*	1965, 1966
G/5 E.*	1965, 1966
G/6*	1965
G/7*	1965
G/8	1951, 1969
G/9	1951, 1969
G/10*	1966
G/11*	1966
G/12*	1966
G/13*	1966
G/14	1951
G/15	1951
G/16	1951, 1969
H/1*	1969

Sheet	Date
104 H/2*	1969
H/3*	1969
H/4*	1969
H/5*	1969
H/6*	1969
H/7*	1969
H/8*	1969
H/9*	1969
H/10*	1969
H/11*	1969
H/12 E.*	1969
H/12 W.	1951, 1969
H/13 E.*	1969
H/13 W.	1951, 1969
H/14*	1969
H/15*	1969
H/16*	1969
I/1†	1970
I/2†	1970
I/3†	1970
I/4 E.†	1970
I/5 E.†	1970
I/6†	1970
I/7†	1970
I/8†	1970
I/9†	1970
I/10†	1970
I/11†	1970
I/12 E.†	1970
I/14†	1970
I/15†	1970
I/16†	1970
J/2 W.	1952
J/3	1952
J/4	1952
J/5	1952
J/12	1952
J/13	1952
K/11†	1970
K/12†	1970
K/13†	1970
K/14†	1970
K/16 E.	1952, 1953
N/1	1953
N/2	1953
N/3 E.	1953
N/3 W.	1970
N/4	1970
N/5	1952
N/6	1952, 1953
N/7 W.	1953
N/7 E., part	1953
N/11 W.	1952
N/12	1952
N/13	1952
P, part	1941
P/15	1941
P/16, part	1941

* Compilation in process.
† Field survey completed.

GEOGRAPHIC DIVISION

W. R. YOUNG, B.C.L.S., CHIEF

Map distribution, though showing only a comparatively modest 3.2 per cent increase over 1969, rose for the fifth successive year. As indicated in Table C, however, the value of maps issued was 46 per cent higher, mainly as the result of an increase in prices for Federally produced maps which took effect on January 1, and for Provincial maps on March 2. In May the price increase for Canadian Government maps was cancelled except for an adjustment in the price of the 1:50,000 scale series.

Late in June the Division was saddened by the death of Les Hooper, Supervisor of Map Production. Mr. Hooper had served in the Division for 46 years, and among his various duties was publication of the Lands Service Annual Report. Besides losing Mr. Hooper's great experience, the Division also lost three draughtsmen through transfer or resignation, of whom only two had been replaced by the end of the year. In addition, there was a turnover in the position of map distribution clerk. More than 10 man-months of staff production were lost as a result of the time-lag in filling the vacancies.

New map production and map reprints are listed in Table F. It may be noted that Map 92K/92J(W) (Bute Inlet), has been increased in longitudinal dimension to include the western half of National Topographic unit 92J. This lightly populated and rugged section of the Coast Mountains can be adequately statused at 1:250,000 scale, while status coverage of the more densely settled and complexly alienated eastern half of unit 92J will be statused and published at 1 inch to 2 miles scale. The first sheet at the latter scale, 92J/NE (Bridge River), was issued in October. As indicated in Table H, pre-publication work is continuing on Map 92J/SE (Pemberton), which is expected to come off the press in 1971. This will complete the replacement of the existing Provincial map-sheet 92J. The concept of stretching 1:250,000 scale maps to cover three degrees of longitude is particularly logical in northern regions where meridional convergence reduces the distance separating longitudinal lines considerably. Thus it is possible to show on the same paper size approximately the same amount of information as on the two-degree sheets in southern regions.

Map IJ (British Columbia), at 1 inch to 30 miles scale, was completely revised and reprinted in 1970. Among the changes incorporated since the 1964 edition of this sheet are new reservoirs on the Peace River and Arrow Lakes, the Pacific Great Eastern Railway extensions in north central and northeastern British Columbia, and the new Northern Trans-Provincial Highway connection from Prince George to Yellowhead Pass. Other alterations include a completely revised post office index, several new district municipalities, such as Houston and Mackenzie, the new Bugaboo Glacier and Cathedral Provincial Parks, and, on the Lower Mainland inset map, the Roberts Bank deep-sea terminal.

Another map of the Provincial Park Series was lithographed in 1970. P.S. (G-3) (Western Garibaldi) at 1 inch to 1 mile scale, shows, in five colours, cultural details and topography of the developed western part of this 760-square-mile park.

Of the 19 maps listed in Table H currently being prepared for reproduction, two (Mount Assiniboine and North Eastern British Columbia) were in lithography at the end of the year. The rest were in various stages of preparation ranging from initial compilation to final colour proving.

Unlike the previous year when stocks of only two Provincial topographic 1:50,000 scale maps were received from Ottawa, a total of 17 full and 28 half-sheets were delivered in 1970. These are listed in Table G. While a few maps continue to be printed in the old east half-west half format, the trend toward joined single sheets continues. Ottawa also supplied stocks of 35 full sheets and three half sheets which were published Federally.

Another 17 topographic manuscripts were sent to Ottawa to join the back-log of 28 sheets awaiting publication. These are listed in Table I.

The *Gazetteer* section checked 43 maps for nomenclature, and added 340 new place-names to the *Gazetteer* records.

In October, two members of the staff carried out field culture checks for revisions to maps 82E/SW (Penticton) and 92H/SW (Chilliwack).

Examples of the 25 special projects done at the request of other departments or agencies were a road map of northern Vancouver Island, map folders for the Survey '70 excursion through British Columbia, a Centennial '71 contest map, maps for the *Annual Financial Review* and *Budget Review,* and legal descriptions of boundary changes to 11 school districts.

The research officer prepared a map-keyed summary of notes in connection with the Survey '70 flying seminar through British Columbia and northwestern North America. In September, the text of the *History of the British Columbia Lands Service* was completed and it is planned to print the history in 1971 as a contribution to the Province's Centennial year. All of the Land Series bulletins were reprinted, with the exception of Peace River Land Series Bulletin (No. 10). As a result of the new 1970 *Land Act,* Land Series Bulletin No. 11 (*Disposition of Crown Lands*) was also completely rewritten for reprinting. The Kootenay Land Series Bulletin (No. 1) appeared as a completely revised second edition. Among the innovations appearing in the second edition of the Kootenay bulletin are separate maps outlining each subarea. These appear at the head of each appropriate subarea section of the bulletin. The former fold-out map was replaced by the map used for Land Series Bulletin No. 11.

In addition to the statistical tables which follow, the reader is referred to Indexes 8 to 14, Index to Published Maps, in the envelope inside the back cover of this Annual Report.

STATISTICS

Table A—Survey Records

	1965	1966	1967	1968	1969	1970
Index cards—						
New	1,693	673	1,184	883	3,088	1,235
Old (rewritten)	1,453	2,482	912	2,102	1,375	750
Total on file	37,240	37,913	39,097	39,980	43,068	44,303
Requests for control attended to	334	368	361	412	495	415

Well-site surveys checked during 1970, 186.

Table B—Canadian Permanent Committee on Geographical Names

	1965	1966	1967	1968	1969	1970
Number of map-sheets or charts checked	93	85	48	49	66	43
Number of names checked	5,584	11,428	13,018	4,754	6,835	7,156
Number of new names recorded	402	440	314	260	233	340

Table C—Map Stock and Distribution

	1965	1966	1967	1968	1969	1970
Number of requisitions filled	9,429	9,550	11,639	12,174	12,311	13,390
Maps issued to department and public	86,755	95,540	114,723	128,303	149,421	154,133
Maps received into stock	107,741	155,133	261,314	221,187	178,386	159,237
Total value of maps issued	$56,152	$62,977	$73,550.82	$77,086.36	$91,633.29	$133,454.32

Table D—Geographic Work for Other Departments and Public

	1965	1966	1967	1968	1969	1970
Total number of items	20	23	22	28	23	25
Total value of work	$4,460	$4,307	$2,927.13	$1,612.36	$5,113.65	$1,888.71

Table E—Letters

	1965	1966	1967	1968	1969	1970
Letters received and attended to	7,297	8,007	9,481	9,044	9,729	10,515

Table F—Maps Prepared and Reproduced by the Geographic Division, Victoria, During 1970

Map No.	Name	Scale	Remarks
	New Editions		
1 J	British Columbia, post offices, roads, etc.	1 in. to 30 mi.	Reprint, complete revision.
1 JNT	British Columbia, showing National Topographic system	1 in. to 30 mi.	Reprint, complete revision.
92 K/92 J(W)	Bute Inlet (third status edition)	1:250,000	Reprint, complete revision.
93 P	Dawson Creek (first status edition)	1:250,000	New, seven colours, contoured.
92J/NE	Bridge River (first status edition)	1 in. to 2 mi.	New, seven colours, contoured.
P.S.G. 3	Western Garibaldi Park	1 in. to 1 mi.	New, five colours, contoured.
	Reprints		
82 E/SE	Grand Forks (first status edition)	1 in. to 2 mi.	Reprint, no revision.
92 H/SW	Chilliwack Lake (second status edition)	1 in. to 2 mi.	Reprint, no revision.
92 K	Bute Inlet (second status edition)	1:250,000	Reprint, no revision.
92 O	Taseko Lakes (first status edition)	1:250,000	Reprint, no revision.
93 G	Prince George (first status edition)	1:250,000	Reprint, no revision.
103 I/J	Prince Rupert-Terrace (second status edition)	1:250,000	Reprint, no revision.

Table G—Provincial Government Topographic Manuscripts Prepared and Reproduced at 1:50,000 Scale by the Canadian Government, Ottawa, During 1970

Map No.	Name	Map No.	Name
92 O/3	Warner Pass (first edition).	102 P/8E	Chic Chic Bay (first edition).
92 O/4	Tchaikazan River (first edition).	102 P/9E	Calvert Island (first edition).
92 O/6	Nadila Creek (first edition).	102 P/16E&W	Hunter Island (first editions).
92 O/7	Churn Creek (first edition).	103 A/1E&W-2E	Bella Bella (first editions).
92 O/10	Gaspard Creek (first edition).	103 A/8E&W	Spiller Channel (first editions).
92 O/11	Bambrick Creek (first edition).	103 A/9E&W	Roderick Island (first editions).
92 O/12	Elkin Creek (first edition).	103 A/13E	Dewdney Island (first edition).
92 P/2	Criss Creek (first edition).	103 G/7E	Bonilla Island (first edition).
92 P/3	Loon Lake (first edition).	103 G/8E&W	Banks Island (first editions).
92 P/6	Green Lake (first edition).	103 G/9E&W	McCauley Island (first editions).
92 P/7	Bridge Lake (first edition).	103 G/10E	Griffith Harbour (first edition).
92 P/10	Deka Lake (first edition).	103 G/15E	Kitkatla Inlet (first edition).
92 P/11	100 Mile House (first edition).	103 G/16E&W	Oona River (first editions).
92 P/14	Lac la Hache (first edition).	103 H/3E&W	Gil Island (first editions).
93 A/3	Murphy Lake (first edition).	103 H/4E&W-G/1E	Trutch Islands (first editions).
93 A/4	150 Mile House (first edition).	103 H/5E&W	Port Stephens (first editions).
93 K/12	Pendleton Bay (first edition).	103 H/6E&W	Hartley Bay (first editions).

Table H—Maps Being Prepared by the Geographic Division, Victoria, During 1970

Map No.	Name	Scale	Remarks
1 D	North Eastern British Columbia.	1 in. to 10 mi.	In lithography.
S.G.S. 1	Vancouver Island (second edition).	1 in. to 6 mi.	In draughting.
92 O	Taseko Lakes (second status edition).	1:250,000	In draughting.
93 D/103A	Bella Coola (third status edition).	1:250,000	In draughting.
93 H	McBride (second status edition).	1:250,000	In draughting.
93 O	Pine Pass (first status edition).	1:250,000	In compilation.
103 P	Nass River (third status edition).	1:250,000	In compilation.
82 E/NE	Upper Kettle River (second status edition).	1 in. to 2 mi.	In compilation.
82 E/NW	Kelowna (third status edition).	1 in. to 2 mi.	In compilation.
82 E/SE	Grand Forks (second status edition).	1 in. to 2 mi.	In draughting.
82 E/SW	Penticton (third status edition).	1 in. to 2 mi.	In compilation.
82 F/SW	Trail (second status edition).	1 in. to 2 mi.	In draughting.
82 J/NW	Mount Assiniboine (first status edition).	1 in. to 2 mi.	In lithography.
92 G/NE	Pitt River (first status edition).	1 in. to 2 mi.	In compilation.
92 G/NW	Squamish (first status edition).	1 in. to 2 mi.	In draughting.
92 H/SW	Chilliwack Lake (third status edition).	1 in. to 2 mi.	In draughting.
92 I/SE	Merritt (third status edition).	1 in. to 2 mi.	In draughting.
92 J/SE	Pemberton (first status edition).	1 in. to 2 mi.	In draughting.
3 R	Fort Nelson (Land Status edition).	1 in. to 1 mi.	In draughting.

Table I—Provincial Government Topographic Manuscripts Being Prepared at 1:50,000 Scale by the Canadian Government, Ottawa, During 1970

Map No.	Name	Map No.	Name
83 D/4	Murtle Lake (first edition).	93 J/6	Youngs Creek (first edition).
83 D/5	Angus Horne Lake (first edition).	93 J/11	Weedon Lake (first edition).
83 D/12	Azure River (first edition).	93 J/12	Carrier Lake (first edition).
83 D/13W	Kiwa Creek (first edition).	93 J/13	Salmon Lake (first edition).
92 O/5	Mount Tatlow (first edition).	93 K/7	Shass Mountain (first edition).
93 A/1	Clearwater Lake (first edition).	93 K/8	Fort St. James (first edition).
93 A/2	McKinley Creek (first edition).	93 K/9	Pinchi Lake (first edition).
93 A/7	MacKay River (first edition).	93 K/10	Stuart Lake (first edition).
93 A/8	Azure Lake (first edition).	93 K/11	Cunningham Lake (first edition).
93 A/9	Hobson Lake (first edition).	93 K/13	Tochcha Lake (first edition).
93 A/10	Quesnel Lake (first edition).	93 K/14	Trembleur Lake (first edition).
93 A/15	Mitchell Lake (first edition).	93 K/15	Inzana Lake (first edition).
93 A/16	Niagara Creek (first edition).	93 K/16	Tezzeron Creek (first edition).
93 G/2	Cottonwood Canyon (first edition).	93 L/15	Driftwood Creek (first edition).
93 G/3	Pantage Lake (first edition).	93 L/16	Fulton Lake (first edition).
93 G/4	Coglistiko River (first edition).	93 M/1	Old Fort Mountain (first edition).
93 G/5	Pelican Lake (first edition).	93 M/2	Harold Price Creek (first edition).
93 G/6	Punchaw Lake (first edition).	93 M/7	Netalzul Mountain (first edition).
93 G/7	Hixon (first edition).	93 M/8	Nakinilerak Lake (first edition).
93 G/10	Red Rock (first edition).	93 M/9	Bulkley House (first edition).
93 G/11	Bobtail Mountain (first edition).	93 M/10	Nilkitkwa River (first edition).
93 G/12	Chilako River (first edition).	93 M/11	Gunanoot Lake (first edition).
93 J/5	Great Beaver Lake (first edition).		

Station Trikle, 5 miles from the British Columbia-Alaska Border, west of the Taku River.

AIR DIVISION

E. R. McMinn, B.A., B.A.Sc., D.L.S., B.C.L.S., P.Eng., Chief

Acquisition of air photographs this year dropped to 30,000, including a large amount of 80-chain cover which will replace old 40-chain Eagle V photography. A Learjet aircraft was again leased for two months to increase the capability for photography in northern areas, but few weather opportunities occurred.

Air-photo production increased by 10 per cent to a new high of 270,000 prints; the time delay in orders was not reduced as effectively as had been planned because of extreme problems in maintenance of the electronic mass production equipment.

The planimetric mapping programme comprised some 13,000 prints instead of the planned 30,000. By May about 350 map-sheets will be completed, just short of the normal output.

FLYING OPERATIONS

The two Zeiss 12-inch cameras and the two Wild R.C. 8 6-inch cameras performed reliably this season with no loss of photo opportunity attributable to any of them. The two R.C. 8 cameras were equipped with deep-orange gelatin filters to assist in haze penetration.

CF-BCD was operational from early spring until the middle of September, at which time it was taken out of service because of a ruptured fuel tank. This was the fourth consecutive year that this unserviceability occurred in one or the other of the two Beechcraft. CF-BCE was fitted with a new design fuel-cell system in the spring of 1970; the same modification will be effected in CF-BCD this winter.

All-metal flaps were installed on both machines to eliminate upkeep on the former fabric-covered types.

The Learjet contract, as before, was for a two-month period, but was extended two weeks by the lessee as compensation for time lost when it was found, on delivery of the aircraft, further modifications were necessary to make it photographically operational, and to compensate for certain unserviceabilities, which accounted for four photo-days being lost in the southern half of the Province.

The use of this high-performance aircraft presented a unique problem in regard to its Zeiss navigation sight. Akin to an inverted periscope, the barrel protruded through the outer skin of the aircraft and was exposed to the reduced pressure and intense cold of high altitude. When the aircraft descended, water vapour entered the prism head and condensed on the extremely cold lens elements. It was then necessary to remove the head after landing to allow the moisture to evaporate before attempting another trip.

A variety of experiments, such as nitrogen-filling and chemical air-drying, were tried to eliminate this problem.

The essential factor underlying the decrease in photo acquisition was the geographical position of the priority areas and their normally poor weather. Seventy-five per cent of 20-chain and 40-chain photography this year was north of 54° latitude, which brought them under the main flow of moist, unstable air that is characteristic of northern British Columbia.

While southern areas experienced near drought conditions, the three photo aircraft were able to work on only 22 days in the north half of the Province. Eight of these days were little over five hours, take-off to landing, and three were over six hours during the most snow-free period, July and August. Also, one-half of the priority 20-chain areas were situated in the relatively early-season, snow-free, north-east corner.

Snow persisted at a lower level in the southern portion of the second-priority Finaly project, which delayed operations there until after the first week of June.

A Learjet captain was hired on a short-term basis and the copilot was provided by the Department of Highways. That Department also made available a Beechcraft pilot and undertook the ground servicing for the jet.

To make up a full complement of three crews, two men skilled in aircrew duties were released from the mapping staff for three months.

A programme to revise old 40-chain photography was undertaken on optional weather opportunities, using the Lear as a camera vehicle. Accomplishment, including 25,300 square miles for the Federal Government, was approximately 80,000 square miles or 23 per cent of the total area of the Province, at a scale of 1 mile to the inch. This production required 57 flying hours.

Projects completed (all or part)	96 of 112
Total hours flown	585:55
Total line miles	33,886
Total number of photos	30,367

Resolution tests were made with Kodak 2405, Kodak Plus-X, and Ilford FP-3 films.

A comparison of the results indicated that the most suitable type for general reconnaissance is Kodak 2405 because of its pleasing tonal range; and for precision mapping work, Ilford FP-3, because of its fine-grain characteristic.

FP-3 is not considered practical for use in 12-inch photography because of its slow speed compared with Kodak 2405.

AIR-PHOTO PROCESSING

The 1970 flying season began in early May and continued throughout the summer until late September. A total of 119 rolls of black-and-white films were exposed during this time.

Although 500-foot rolls of film are used in the cameras, they are cut and spooled in 250-foot rolls for ease of handling and storage. Ten rolls of Kodak Aero Color Neg. film were exposed this year, but these films were processed for us by the National Air Photo Unit, who also supplied prints as required at extremely low prices.

All black-and-white air films, as well as Topographic 116 films, miscellaneous sheet films from 4 x 5 to 11 x 14 were processed in the Kodak Versamat processor.

A new printer, a Logetron Mk. II, was put into use in May. Some 675 hours of maintenance work have been expended on the three printers.

A new Beseler 4 x 5 enlarger with three lenses of varying focal lengths was acquired early in the season; the old equipment was donated to the New Denver School.

COMPILATION AND DRAUGHTING

This year, 30,000 forest-inventory photos were requested; some 16,000 were taken and of these 3,000 covered only small parts of projects, so that about 13,000 were left to be processed. These represent just under the normal output of 400 map-sheets.

This was the first year of production in the agreement to produce 20-chain maps tailored specifically to cater to the Forest Inventory Draughting Office standards. The Forest Draughting Office retained the original copy, and a sepia was returned to the Air Division for the eventual reduction to 40 chains as a method of developing and revising this series.

This new method of production assembly eliminated all duplication of effort in the two divisions involved. In the Air Division, the first step eliminated the work-sheet stage; the sheet on which the final tracing is produced with grids and survey control is initiated in the draughting office. It then proceeds to the plotting-floor where photo-centres and wing points are added lightly in pencil. In the next stage, most of the map detail is added in ink, and finally into the draughting office for the addition of the cadastral surveys, and any remaining ink work. Only roads and the heights of land which are Forestry's compartment boundaries remain in pencil.

Some sacrifice in the amount of detail is apparent—made necessary by the wealth of material to be added in the inventory programme—when it is considered that this series, for the Air Division purposes, will be reduced to 40 chains, the new map will have an acceptable density of detail.

Total production saw 450 finished 20-chain sheets, the reduction amalgamation of 156 20-chain sheets to produce 39 new 40-chain sheets, and a further 128 sheets to produce 32 more 40-chain sheets near completion.

The mapping of the E. and N. Belt at 20 chains to 1 inch, which commenced in 1969, was completed this year. This was a detailed production and many hours of work were necessary to settle the controversial lot pattern in this area.

A major work was undertaken by the Compilation Section in the Dawson Creek area where the lack of mapping control in northern areas for the Forest Inventory programme required the plotting of the Federal and Provincial townships to use in processing the slotted template laydowns. Five traverses were programmed through the IBM computer, and numerous routes through the lot surveys were plotted.

Lot compilation rose from 95 sheets in 1969 to 221 in 1970. Control sheets decreased from 748 to 334 in the same period.

20-chain Compilation, 1970

	Control	Lot Compilation
Dawson Creek	140	126
Eagle	24	11
Kingcome	8	21
Longworth	66	23
Quesnel	96	40
	334	221

INSTRUMENT-SHOP

In addition to the annual preventive maintenance of the Division's four aerial cameras, a special study was made of a problem which occurred when one Zeiss film magazine and camera were used together. The report at the conclusion of the investigation showed that there had been a slight misalignment of one of the magazine components at the time of manufacture. Keuffel and Esser Co., which does the aerial camera maintenance for the Zeiss Company in Canada, agreed with the report and sent a technician to Victoria to correct the error.

The two Wild R.C. 8 mapping cameras were inspected in preparation for calibration in Ottawa by the National Research Council.

Maintenance of the Topographic Division's horizontal cameras and their F-24 vertical cameras was carried out. Some parts for the F-24 camera are virtually impossible to obtain, and some trouble was experienced with these cameras during the summer.

A small, horizontal navigation sight for use through the front window of the Learjet was designed and built.

Seven pairs of binoculars were either evaluated or repaired for the British Columbia Forest Service, and one pair of Russian-made binoculars is being evaluated for the Purchasing Commission.

The Air Division purchased a Logetronic photographic printer in May of this year, and the Shop personnel worked with the factory technician to install and set up this new printer.

The operation of the printer has not been faultless, and the lack of a comprehensive maintenance manual, plus the great distance between Victoria and Springfield, Virginia, where Logetronic Inc. are located, has made servicing of this printer difficult.

With the output of three electronic printers now being processed by the Versamat continuous processor, it is essential that the printers operate consistently within very small tolerances—probably smaller tolerances than the machines were designed to maintain. As a result of this, a heavy work load has been placed on the Shop personnel who are responsible for the maintenance, adjustment, and monitoring of the printers.

In order to provide a calibration of scan control, electronic scan counters were designed and built for the Air Division's two original printers. These counters provided the degree of exposure control that was needed to meet requirements.

New stainless-steel sinks were purchased for the colour darkroom and the Versamat-room. The installation was done by Public Works, and this Shop provided the additional fittings such as shelves, cupboards, and duck-boards.

One set of film-spool winding handles was designed and built for the Logetronic printer, and two sets of film-spool winders were modified for the other printers. The winders now allow a fore-and-aft positioning of the film on the printer glass and provide for a controllable amount of friction on the film advance.

Studs and threaded sleeves for the Jayco slotted template cutters were made and hardened. Some problems were experienced during the hardening process as this Shop does not have equipment which allows control during the hardening process.

Twenty scribing-tool holders were built for use in the Topographic draughting office.

The 24-volt direct-current power supply used in the Shop to operate the aerial cameras for maintenance or training was rebuilt to provide a more stable current to operate the large cameras.

REPORTS

A two-hour illustrated lecture on "Aerial Photography for Forest Inventory Purposes" was prepared and given to the Forest Inventory personnel.

The following reports were prepared during the year:

B.C.F.S. Binoculars.
Zeiss Camera Maintenance.
Zeiss Magazine Malfunction.
Zeiss Camera Maintenance—Supplement.
Proposed List of 1970 Film Tests.
Supplement to List of 1970 Film Tests.
Report on Film and Film Tests (FP3, PX2402, SDX2405).
Report on Topographic Light Meters.
B.C.F.S. Binoculars.
B.C.F.S. Binoculars.
Logetron Maintenance.
Report on Ilford HP3 Film.

STATISTICS

1970 Air Operations Cost Summary By Projects

	Aircraft Hours	Accomplishment: No. of Photos	Accomplishment: Lineal Miles	Flying Costs	Photographic Costs	Total Costs
A. 80-chain vertical cover—						
1. New cover—						
Agriculture Department—						
82 K	4:00	245	790	$837.39	$658.74	$1,496.13
93 O and 94 B	1:15	65	300	261.68	174.77	436.45
Subtotals	5:15	310	1,090	$1,099.08	$833.51	$1,932.59
Federal Government—						
82 F	2:25	115	320	$505.92	$309.20	$815.12
82 G	2:35	220	350	540.82	591.52	1,132.34
92 J, K, L	9:05	600	1,700	1,901.59	1,613.23	3,514.82
92 M, N, O	5:00	385	1,050	1,046.74	1,035.16	2,081.90
93 A, B	2:20	200	650	488.47	537.75	1,026.22
Subtotals	21:25	1,520	4,070	$4,483.54	$4,086.86	$8,570.40
Internal—						
82 K	1:25	80	265	$296.57	$215.10	$511.67
82 M and 82 N	7:50	650	1,940	1,639.89	1,747.67	3,387.56
83 C and 83 D	4:30	325	1,110	942.07	873.84	1,815.91
83 E and 93 H	1:40	120	440	348.92	322.65	671.57
92 B and 92 C	2:50	150	580	593.15	403.31	996.46
93 J and 93 K	3:10	165	585	662.95	443.64	1,106.59
93 N and 93 O	5:00	295	1,060	1,046.74	793.17	1,839.91
93 O and 94 B	1:35	125	315	331.46	336.09	667.55
Subtotals	28:00	1,910	6,295	$5,861.75	$5,135.47	$10,997.22
Water Resources—						
82 E	3:05	185	700	$645.49	$497.42	$1,142.91
82 L	5:00	295	1,100	1,046.74	793.17	1,839.91
104 N	:30	45	145	104.67	120.99	225.66
Subtotals	8:35	525	1,945	$1,796.90	$1,411.58	$3,208.48
Totals	63:15	4,265	13,400	$13,241.27	$11,467.42	$24,708.69
Average cost	.....	$5.79	$1.84	.....	.....	.....
B. 40-chain vertical cover—						
1. New Cover—Forest Surveys and Inventory Division—						
Kechika PSYU	7:35	680	1,125	$1,587.55	$1,828.33	$3,415.88
Stikine PSYU	10:35	260	490	2,215.61	699.07	2,914.68
Subtotals	18:10	940	1,615	$3,803.16	$2,527.40	$6,330.56
2. Improvement flying — Topographic Division—93 B refly	1:00	15	25	209.35	40.33	249.68
Totals	19:10	955	1,640	$4,012.51	$2,567.73	$6,580.24
Average cost	.....	$6.89	$4.01	.....	.....	.....
C. 20-chain vertical cover—						
1. New cover—						
Forest Surveys and Inventory Division—						
Dawson Creek PSYU	79:25	4,735	3,525	$16,625.74	$12,731.11	$29,356.85
Eagle PSYU	6:05	490	344	1,273.54	1,317.48	2,591.02
Finlay PSYU	37:40	1,885	1,568	7,885.44	5,068.25	12,953.69
Kingcome PSYU	4:30	410	300	942.07	1,102.38	2,044.45
Kotcho PSYU	24:35	1,715	1,420	5,146.47	4,611.17	9,757.64
Longworth PSYU	10:00	850	613	2,093.48	2,285.42	4,378.90
Quesnel PSYU	21:00	1,500	1,100	4,396.32	4,033.09	8,429.41
Babine Lake PSYU	1:00	150	113	209.35	403.31	612.66
Subtotals	184:15	11,735	8,983	$38,572.41	$31,552.21	$70,124.62
Department of Finance — West Coast Vancouver Island	15:15	1,400	1,192	$3,192.56	$3,764.22	$6,956.78
2. Revision—						
Forest Surveys and Inventory Division—						
Babine Lake	1:00	150	113	$209.35	$403.31	$612.66
Botanie Colour	6:50	135	96	1,430.54	362.98	1,793.52
Eagle PSYU	6:00	400	290	1,256.09	1,075.49	2,331.58
Kingcome PSYU	9:00	690	505	1,884.13	1,855.22	3,739.35

1970 Air Operations Cost Summary By Projects—*Continued*

	Aircraft Hours	Accomplishment		Flying Costs	Photographic Costs	Total Costs
		No. of Photos	Lineal Miles			
C. 20-chain vertical cover—*Continued*						
2. Revision—*Continued*						
Forest Surveys and Inventory Division—*Continued*						
Longworth PSYU	21:35	1,570	1,135	$4,518.44	$4,221.30	$8,739.74
Quesnel Lakes PSYU	20:00	1,595	1,158	4,186.96	4,288.52	8,475.48
Seymour PSYU	13:35	620	481	2,843.65	1,667.01	4,510.66
Subtotals	78:00	5,160	3,778	$16,329.16	$13,873.83	$30,202.99
Finance Department—						
Cameron River	2:00	190	168	$418.70	$510.86	$929.56
West Coast Vancouver Island	8:00	1,000	780	1,674.79	2,688.72	4,363.51
Subtotals	10:00	1,190	948	$2,093.49	$3,199.58	$5,293.07
Land Inspection Division — Lone Prairie	2:40	240	186	$558.26	$645.29	$1,203.55
Totals	290:10	19,725	15,087	$60,745.88	$53,035.13	$113,781.01
Average cost	.....	$5.77	$7.54	.....	.....	.....
D. Special projects—						
Agriculture Department — Okanagan Valley (colour)	7:10	390	314	$1,500.33	$1,048.60	$2,548.93
British Columbia Hydro—						
Goward transmission-line	:45	140	11	157.01	376.42	533.43
Pike Lake–Sidney	:15	12	3	52.34	32.26	84.60
Mica Pondage	5:00	160	250	1,046.74	430.20	1,476.94
District Forester, Kamloops — Mable Lake Treatment Area	2:00	53	10	418.70	142.50	561.20
Finance Department—						
Bishop Creek	1:05	10	1	226.79	26.89	253.68
Next Creek	4:30	120	77	942.07	322.65	1,264.72
Forest Engineering—						
Beach Wood survey	:20	25	2	69.78	67.21	136.99
Bowron River	1:15	45	32	261.69	120.99	382.68
Coquihalla River	2:00	31	21	418.70	83.35	502.05
Kingcome	:35	6	1	122.11	16.32	138.43
Libby Reservoir	3:00	68	51	628.04	182.82	810.86
Lodgepole–Flathead	2:10	59	43	453.59	158.63	612.22
Mica Pondage	8:20	409	304	1,744.57	1,099.68	2,844.25
Highways Department — Fort Nelson–Fort Simpson Road	4:25	.....	.....	924.62	.....	924.62
Lands Department—						
Callaghan Creek	2:20	70	34	488.48	188.21	676.69
Cypress Bowl	1:20	20	9	279.13	53.77	332.90
Fort Nelson	1:50	322	91	383.80	865.76	1,249.56
Green Lake	1:45	17	10	366.36	45.71	412.07
Hatch Point	:35	21	2	122.11	56.46	178.57
Jordan River	:20	13	4	69.78	34.95	104.73
Miami Island	:30	.....	.....	104.67	.....	104.67
Owen Lake	:30	7	5	104.67	18.82	123.49
Rupert Inlet	:50	20	3	174.46	53.77	228.23
Summit Lake	:40	11	4	139.56	29.58	169.14
UBC	2:00	69	11	418.70	185.52	604.22
Land Inspection Division—						
Anderson Lake	1:50	30	21	383.80	80.66	464.46
Creston	3:15	99	45	680.38	266.17	946.55
Discovery Passage	1:00	12	9	209.35	32.26	241.61
Jordan River	1:30	8	1	314.02	21.51	335.53
Muchalat Inlet	:45	15	10	157.01	40.33	197.34
Port Alice	:30	13	5	104.67	34.95	139.62
Tahsis Inlet	1:30	15	13	314.02	40.33	354.35
Ucluelet	:30	6	4	104.67	16.13	120.80
Pollution Control Board — Victoria waterfront (colour)	1:55	100	20	401.24	268.87	670.11
Public Works Department—						
BCIT Burnaby	:35	10	3	122.11	26.89	149.00
Colquitz Development Area	:35	50	7	122.11	134.44	256.55
Downtown Victoria	:30	15	2	104.67	40.33	145.00

1970 Air Operations Cost Summary By Projects—*Continued*

	Aircraft Hours	Accomplishment		Flying Costs	Photographic Costs	Total Costs
		No. of Photos	Lineal Miles			
D. Special projects—*Continued*						
Recreation and Conservation Department—						
Barclay Sound	1:00	64	20	$209.35	$172.08	$381.43
Boundary Bay–White Rock	2:45	105	83	575.71	282.31	858.02
West Coast Trail	2:20	88	82	488.48	236.61	725.09
Topographic Division—						
104 A and 104 B	1:20	.....	.....	279.13	.....	279.13
East Sooke	:40	10	6	139.56	26.89	166.45
Kootenay River–Wardner	1:30	65	12	314.02	174.77	488.79
North Cowichan Municipality	1:30	171	102	314.02	459.76	773.78
Orthophoto test	:40	5	10	139.56	13.44	153.00
Triangulation stations	11:50	180	100	2,477.29	483.96	2,961.25
Water Resources—						
Creston	5:40	250	130	1,186.31	672.17	1,858.48
Fraser River low water	4:15	75	120	889.73	201.65	1,091.38
Kennedy River Slide	1:45	33	3	366.36	88.73	455.09
Kitimat River Basin	4:15	141	243	889.73	379.10	1,268.83
Lambly Lake	:30	7	2	104.67	18.82	123.49
Liard River	13:55	367	339	2,913.42	986.75	3,900.17
Mission Creek	1:55	42	20	401.24	112.93	514.17
Nakina–Atlin Watershed	8:25	208	217	1,762.01	559.24	2,321.25
Okanagan North	6:05	450	346	1,273.53	1,209.93	2,483.46
Princeton Storage Reservoir	2:25	37	20	505.92	99.48	605.40
Southeast Kelowna	1:55	55	46	401.24	147.88	549.12
Summerland	2:00	65	39	418.70	174.77	593.47
Slocan Valley	4:00	141	85	837.39	379.11	1,216.50
Taku-Nakina	:35	53	77	122.11	142.50	264.61
University of British Columbia—Cleland Island	1:30	12	5	314.20	32.26	346.46
E. Internal—						
94 O and 94 P	2:20	.....	.....	488.48	.....	488.48
Colburne Passage	:35	16	1	122.11	43.02	165.13
Legislative Precinct	:25	20	2	87.22	53.77	140.99
North Thompson Highway	6:30	271	212	1,360.76	728.64	2,089.40
Prospect Lake	:15	15	1	52.34	40.33	92.67
Roberts Bank	:10	5	3	34.89	13.44	48.33
Totals	162:55	5,422	3,759	$34,106.33	$14,578.28	$48,684.61
Average cost	.....	$8.98	$12.95	.....	.....	.....
F. Miscellaneous Flying—Internal—						
Aircraft maintenance[1]	18:50	.....	.....	.....	.....	.....
Administration	12:20	.....	.....	$2,581.96	.....	$2,581.96
Camera and film tests	9:35	.....	.....	2,006.25	.....	2,006.25
Oblique photography	1:25	.....	.....	296.57	.....	296.57
Training[1]	8:15	.....	.....	.....	.....	.....
Totals	50:25	.....	.....	$4,884.78	.....	$4,884.78
Grand Totals	585:55	30,367	33,886	$116,990.77	$81,648.56	$198,639.33[2]

[1] Cost of maintenance and training charged to all projects.
[2] Includes $82,579.89 for 2-month lease and operation of a Lear Jet.

Orders for Standard Prints (9 by 9 Inches) From British Columbia Negatives, 1970

	Reprints		Loans	
	Requisitions	Number	Requisitions	Number
Public—				
Mining industries	455	32,823	420	15,304
Forest industries	344	17,280	223	7,113
Municipalities	28	2,131	6	219
Schools	244	9,467	69	2,458
Commercial air survey	205	4,401	104	1,308
Miscellaneous	1,214	16,777	318	3,928
Totals	2,490	82,879	1,140	30,330
Federal Government	76	19,141	89	6,133
Provincial Government—				
Lands and Water Resources	403	38,874	349	21,451
British Columbia Forest Service	169	114,411	400	7,622
Other Government departments	171	16,336	425	7,076
Totals	743	169,621	1,174	36,149
Grand totals	3,309	271,641	2,403	72,612

MISCELLANEOUS

	Completed
Enlargements	2,930
Transparencies	200
35-mm. slides	140
Diapositive plates	1,594
Colour	180
Autopositives	325
Mosaic contacts	118
Air films—rolls	119
Ground negatives—rolls	56

Public Loans and Reprints

	1966	1967	1968	1969	1970
Loans	15,680	13,123	13,127	24,442	30,330
Reprints	61,276	50,918	60,794	79,920	83,879
Totals	76,956	64,041	73,921	104,362	114,209

Letters Inward And Loans

Letters inward	3,194
Loan service requisitions	845
Loan fees	$7,368

Revenue

Cash sales	$10,210.56
Land accounts	$100,710.31
Total	$110,920.87

PRODUCTION RECORD TO 1970, PROCESS LABORATORY

	1946–67	1968	1969	1970	Grand Total
Processing completed—					
Air films—					
RC8, OSC, Zeiss	780	105.5	163	119	1,167.5
F24 and Eagle	2,832	5	4	4	2,845
F24, F8, K20 obliques	75.5	10	8	2	95.5
Test rolls	29.5	.5	.....	2	31.5
Colour—RC8 and Zeiss	13.5	8	10	10	41.5
70 mm.—black and white	4,735	600	1,100	.....	6,435
70 mm.—colour	750	.....	700	.....	1,450
Topographic (116)	4,039	.....	67	230	4,336
Dominion Hydrographic K20	12.5	1	2	2	17.5
Printing completed—					
Standard prints (5 x 5″ enlarged to 10 x 10″)	2,003,326	27,236	56,121	23,144	2,109,827
Contact prints (5 x 5″)	46,087	184	.....	.....	46,271
Kenora prints (9 x 9″ reduced to 5 x 5″)	4,132	.....	.....	.....	4,132
Contact prints — Centel and Milligan and Logetron (10 x 10″)	761,865	177,651	196,906	248,497	1,384,919
Contact prints Colour (10 x 10″)	.....	.....	.....	180	180
Contact prints (20 x 24″ and larger)	3,783	56	51	118	4,008
Enlargements (up to 40 x 96″)	30,634	1,363	1,534	2,930	36,461
Topographic (11 x 14″)	23,754	.....	.....	559	24,313
Lantern slides (2 x 2″ (stereo and 35 mm.))	384	17	237	140	778
Autopositive films (up to 40 x 42″)	8,512	172	918	325	9,227
Film transparencies (up to 40 x 46″)	1,620	297	324	200	2,441
Film transparencies (photo drawings)	19	.....	.....	.....	19
Kelsh, A7, A8, plates, films, and miscellaneous ground negatives	6,228	875	1,072	1,594	9,769
Requisitions completed	44,258	4,085	3,907	3,750	56,000

UNIVERSITY ENDOWMENT LANDS

UNIVERSITY ENDOWMENT LANDS

R. P. MURDOCH, PROJECT MANAGER

In 1966, work was commenced for the filling of No. 1 Ravine to a point which would allow the extension of Fourth Avenue westward from Drummond Drive. This project which required approximately 1 million cubic yards of fill, has been completed. Preliminary design is underway for the development of the road allowance. The extending of Fourth Avenue into Chancellor Boulevard will facilitate the flow of traffic onto the University of British Columbia campus. The problem of handling the substantial volume of cars in a concentrated period of time still remains to be solved. The two major roads which will contribute considerably to the solution are the completion of Southwest Marine Drive and 16th Avenue west of Blanca Street.

This past year has seen preliminary exploration into the possibility of locating a research park in the University Endowment Lands, with an area of approximately 100 acres being considered.

University of British Columbia Housing Administration is presently constructing twin 18-story towers. The amount of accommodation and rates being charged by the University Housing Administration for student living-quarters have created a problem for the fraternities located in the University Endowment Lands. It has reached a point where some of the fraternities are looking for ways of disposing of their houses.

Alternate land-use proposals are being considered for Block 89, presently occupied by fraternity houses, which will assist the fraternities out of their present financial difficulties.

During this past year steps have been taken to implement the recommendations of the Canadian Underwriters' report on fire protection for the area. Delivery has been made of a new attack pumper-truck. Steps were also taken to place a reserve on a future fire-hall location.

The lease in favour of the Westward Ho Golf Course Limited expired May 31, 1970, and the course is presently being occupied on a caretaker basis. It is most desirable that the 123 acres involved continue to be used as a golf course.

There remains a broad interest in the possibility of future development of the University Endowment Lands for single-family, multiple-dwelling, and commercial development.

The following tabulation shows comparative revenue figures for the past 10 years, together with a summary of building permits. It is noted that during this last year our total revenue is at an all-time high, exceeding $900,000 for the first time.

UNIVERSITY ENDOWMENT LANDS' REVENUE—1961 TO 1970, INCLUSIVE

Year	Local Improvement Taxes	Water	Leases and Sundry Rents	No. 1 Ravine Fill	Garbage, Permits, and Miscellaneous Revenue	Miscellaneous Interest	General Taxes and Grants	Total Revenue
1961	$12,427.09	$84,435.63	$11,768.33	.....	$10,871.14	$43.91	$323,500.91	$443,047.01
1962	10,320.99	86,400.08	15,277.73	.....	11,213.19	16.49	198,619.59	321,848.07
1963	10,384.36	112,994.52	10,653.33	.....	10,443.74	40.17	310,014.95	454,531.07
1964	8,349.54	126,986.47	21,197.34	.....	32,219.69	12.14	343,299.13	532,064.31
1965	8,712.46	117,757.11	34,833.75	.....	32,353.31	74.45	306,337.79	500,068.87
1966	8,825.13	114,098.68	34,799.64	$4,359.90	16,276.16	79.91	316,864.84	495,304.26
1967	17,963.94	135,870.74	49,745.23	2,085.60	33,511.69	122.87	331,278.61	570,578.68
1968	8,961.99	160,610.25	36,148.37	5,151.00	25,151.73	15.00	377,143.37	613,181.71
1969	4,994.21	157,368.01	42,476.19	412.00	11,963.05	19.73	411,087.69	628,320.88
1970	5,896.30	180,441.79	39,658.85	724.00	40,056.60	20.18	661,825.82	928,623.54
Totals	$96,836.01	$1,276,963.28	$296,558.76	$12,732.50	$224,060.30	$444.85	$3,579,972.70	$5,487,568.40

Number and Value of Building Permits Issued for the Calendar Years 1968, 1969, and 1970

	1968		1969		1970	
	Number	Value	Number	Value	Number	Value
New dwellings	----	----------	1	$75,000.00	----	----------
New fraternity houses	----	----------	1	125,000.00	----	----------
New students' centre	----	----------	1	30,000.00	----	----------
Alterations to dwellings	13	$51,900.00	14	75,771.00	22	$143,700.00
Alterations to commercial buildings	3	66,500.00	22	87,000.00	3	10,000.00
Alterations to churches	1	19,000.00	----	----------	----	----------
Garages, etc.	3	1,200.00	3	3,700.00	12	18,150.00
Swimming-pools	2	8,400.00	4	58,000.00	3	16,500.00
Totals	22	$147,000.00	26	$454,471.00	40	$188,350.00

PERSONNEL OFFICE

PERSONNEL OFFICE

K. M. HANSON, PERSONNEL OFFICER

The year 1970 had its high and low points as far as the Personnel Office was concerned. The high point was April when all positions were filled. Recruitment was down considerably from 1969, as were promotions and internal transfers. Due to nation-wide economic conditions, terminations were drastically reduced. The summer work programme involving students was on a much smaller scale, hence the staff requirements for the summer were also down. The establishment of the Department was increased by one position, that of a Fire Prevention Officer at the University Endowment Lands.

	1967	1968	1969	1970
Recruitments for continuous staff	55	52	45	34
Reclassifications	39	25	22	41
Promotions	19	24	16	7
Internal transfers	11	2	6	6
Transfers to other departments	17	13	8	4
Transfers from other departments	12	8	5	5
Terminations of continuous staff	43	40	42	36
Retirements	3	3	1	2
Short-term, casual appointments	77	59	52	38

In November 1970, Messrs. V. G. Knapik, R. F. Oberg, and R. A. Paine were awarded diplomas in public administration, having completed the three-year training programme. Other employees of this Department taking the course are G. H. Wilson, A. C. Bridge, and A. G. Anderson, Fort St. John (third year); W. C. Fry and T. J. Todd, Burns Lake (second year); D. Conway and D. B. Smith (first year).

Promotions of interest during the year included W. A. Taylor to the position of Chief of the Legal Surveys Division and R. W. Thorpe to Supervising Surveyor, Legal Surveys Division. These promotions were the result of the retirement of D. Pearmain, Chief of the Legal Surveys Division, after 50 years' service. Other retirements included that of J. A. Paul from the Land Inspection Division, Pouce Coupe.

In June of this year, Les Hooper of the Geographic Division died suddenly while in service.

The year as a whole was successful, even though there was a considerable increase in long- and short-term illnesses.

MAIL AND FILE ROOM

MAIL AND FILE ROOM

DAVID S. PRESTON

Letters received in the Department during 1970 amounted to 260,420, compared to 272,431 in 1969. The decrease in total mail recorded might be attributed to the slowing economic trend in the latter part of the year. The Lands portion of the mail did, however, show an increase, indicating a continued interest in Crown land.

The new colour-code filing system was completed in June and is now operating better than expected. Open-shelf filing with the colour and number bar for indentification has greatly eliminated the common errors in filing. When an error in filing has taken place it can be visually spotted without actually handling the file. The old cabinet filing system (*see* photographs) required handling of files other than the one required, therefore adding a physical search as well as visual. When files were misplaced in the cabinet system they could not be located easily, if at all. In the new system one person can check the entire file vault visually in approximately three hours. When the vault was renovated, three other associated items, file registers, microfilmed files and file charge control were included with it, thereby making it possible for anyone seeking file information to get it all in one place.

Microfilm began in October and will continue through 1971/72. It is anticipated this filming will eliminate many of the old unused files and make space for new material.

LETTERS INWARD

Branch	1970	1969	10-year Average, 1961–70
Lands	69,819	64,298	55,405
Forests	130,614	145,536	140,676
Water Resources	35,532	36,706	30,403
Surveys and Mapping	24,455	25,891	22,711
Totals	260,420	272,431	249,195

LETTERS OUTWARD (RECORDED)

Lands	17,340	15,417	14,566
Forests	2,300	1,900	1,932
Totals	19,640	17,317	16,498

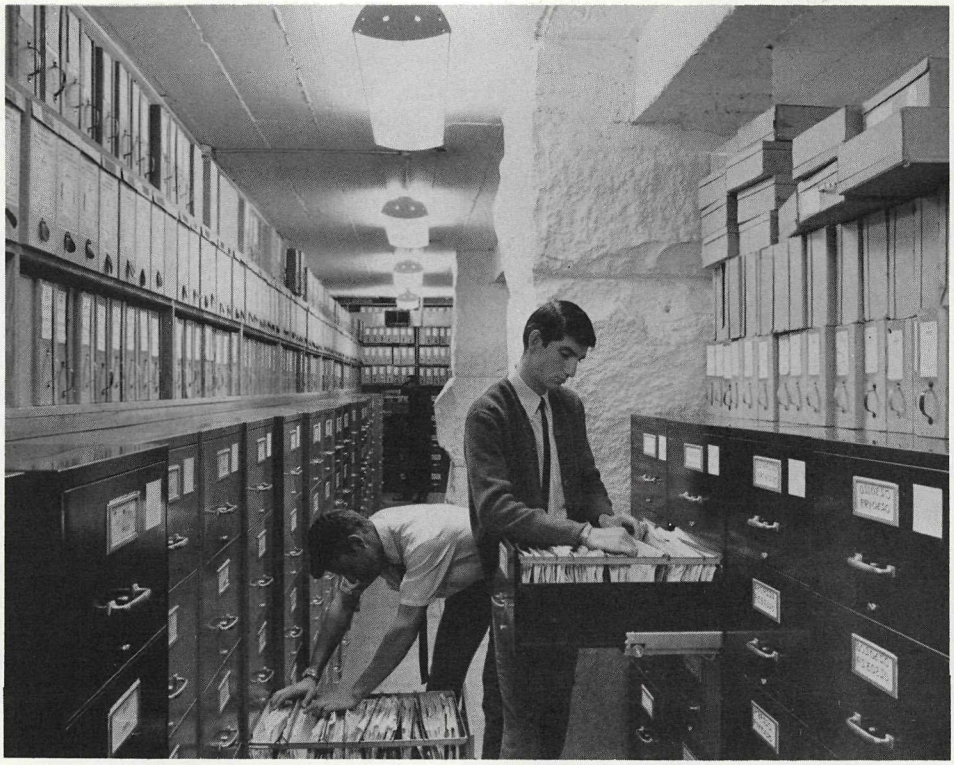
MISCELLANEOUS REPORTS

Designation	1970	1969	10-year Average, 1961–70
Forest-fire reports	4,003	2,318	3,404
Logging-inspection reports	8,540	8,360	11,310
Land-classification reports	5,608	6,137	5,317
Stumpage-adjustment notices	12,035	21,636	6,921
Totals	30,186	38,451	26,952

NEW FILES CREATED

"O" files	8,369	7,727	6,858
Timber mark files	1,510	1,753	1,541
Timber sale files	865	1,574	1,766
Totals	10,744	11,054	10,165

Micro-film Reference, 851.



Old filing system before conversion and modernization.

Filing system after conversion to open-file colour coding.

—Photos by British Columbia Forest Service.