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

1969

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in right of the Province of British Columbia.
1970

VICTORIA, BRITISH COLUMBIA, February 16, 1970.

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, 1969.

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

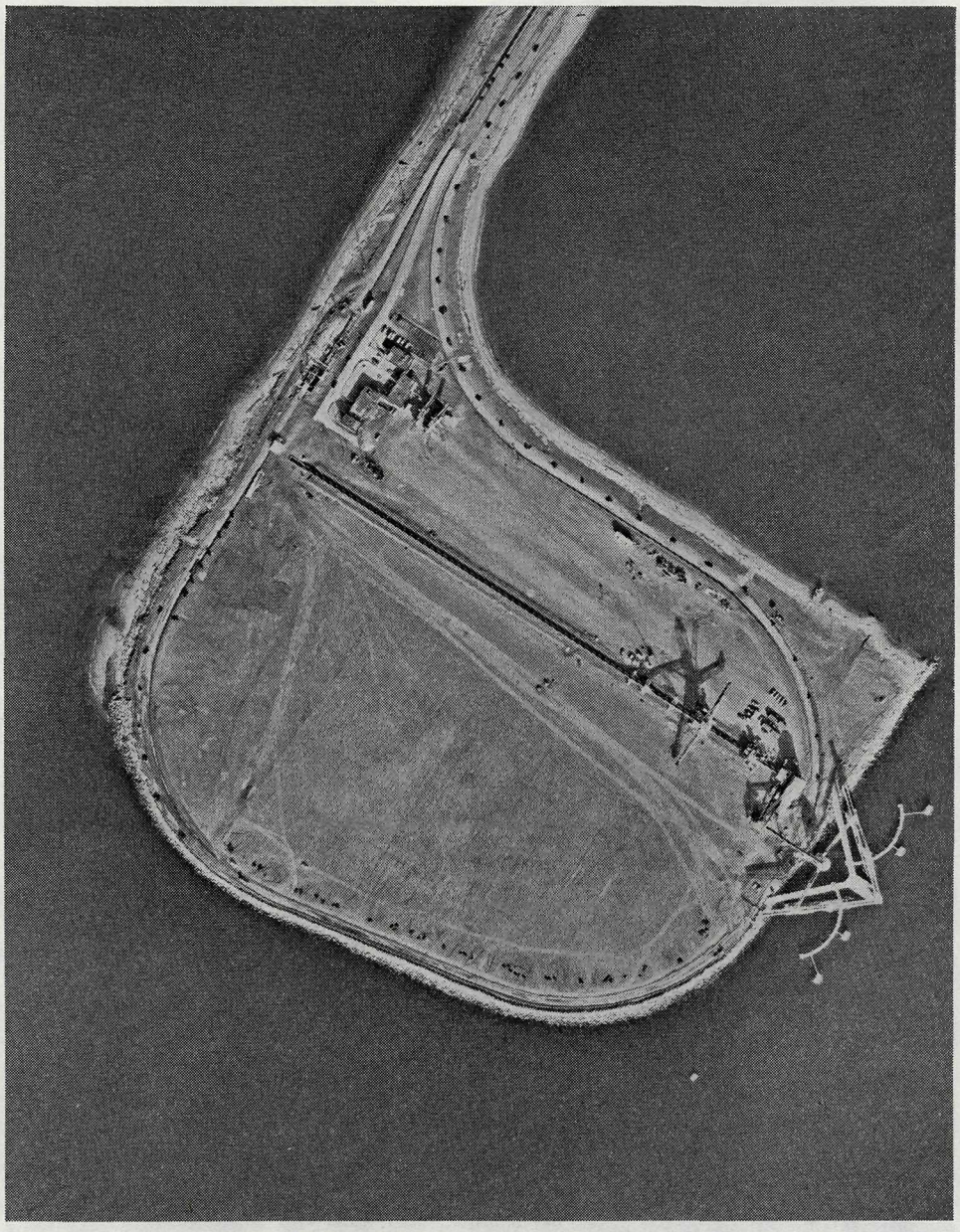
VICTORIA, BRITISH COLUMBIA, February 16, 1970.

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, 1969.

D. BORTHWICK,
Deputy Minister of Lands.

Roberts Bank Superport and Tsawwassen ferry terminal. For construction detail of superport *see* overleaf.



Construction detail of Roberts Bank Superport. Photo by Air Division, Surveys and Mapping Branch, Department of Lands, Forests, and Water Resources, January, 1970.

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COVER PHOTO

Bugaboo Glacier with Marmolata Mountain to left, Bugaboo Alpine Recreation Area, 40 miles south from Golden.

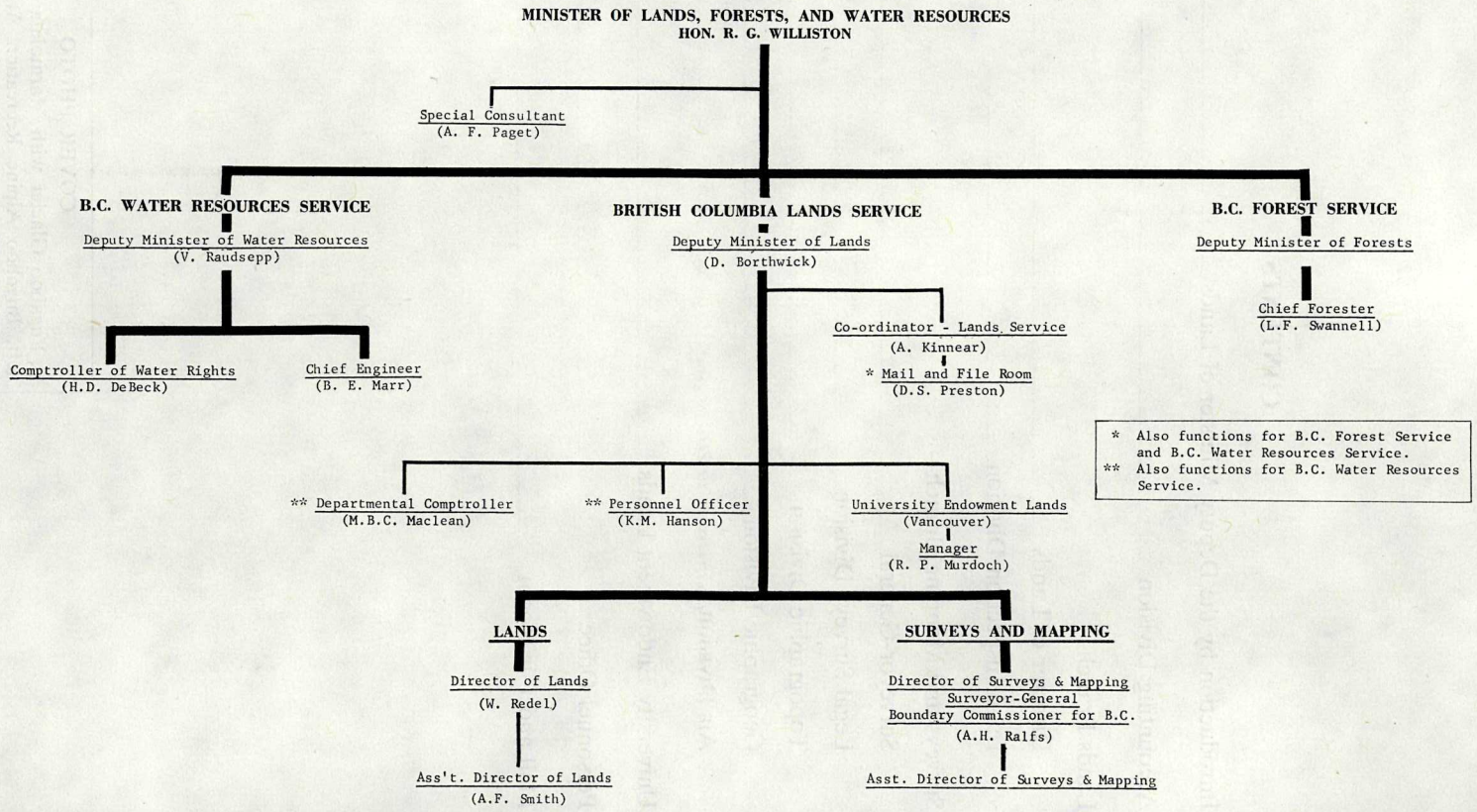
ORGANIZATION

BRITISH COLUMBIA LANDS SERVICE

DEPARTMENT OF LANDS, FORESTS, AND WATER RESOURCES

Victoria, B.C.

Year ending December 31, 1969



Report of the British Columbia Lands Service

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

Title to lands not alienated to private control or administered by the Federal or municipal governments lies in the Crown in the right of the Province of British Columbia. British Columbia holds title to a major portion, over 90 per cent, of its land area, and among the Provinces of Canada only Quebec has such a high proportion of Crown land. This does not mean that Crown lands are vacant and unused. Prospecting and mineral development take place largely on Provincial land. Tens of thousands of head of cattle graze on it. Crown forests yield huge volumes of wood for a billion-dollar forest industry. Extensive areas have been set aside for parks and recreation, timber growing, municipal water supplies, and other public purposes. Careful management of the land resources now and in the future will assure a lasting foundation for the well-being of the people of this Province.

During 1969, nearly two-thirds of the Lands Service revenue collections of $4,000,000 were from Crown land leases and rentals, a reflection of the trend, which has been evident for several years, toward lease hold alienation.

Although the number of new applications for land climbed nearly 10 per cent in 1969, there was a slight decrease in land inspections, mainly as the result of removing the inspection requirement for agricultural and home-site leases after the initial three-year period of tenure. The number of inspections outstanding at the end of the year also declined slightly.

Interest in northern lands remains strong. While less than 10 per cent of the Provincial population lives north of the 53rd parallel, the number of land inspections processed in the Burns Lake, Fort St. John, Pouce Coupe, Prince George, Prince Rupert, Smithers, and Vanderhoof districts accounted for 45 per cent of the Provincial total in 1969. In view of the recent and projected extensions of transmission-lines, pipe-lines, roads, and railways and large investments in resource-based industries in the north, the high level of interest in Crown land should continue.

In order to pre-evaluate their potential for various uses, several large tracts of Crown land in the vicinity of Fort Nelson, Fort St. James, Francois Lake, and the Northern Trans-Provincial Highway east of Prince George were examined during the year.

Under special circumstances and where conditions permit, the Crown may assist municipalities to acquire private land for municipal purposes. The Lands Service acts as an intermediary in a tripartite transaction where, after appraisal, Crown lands may be exchanged for private lands, which in turn are conveyed to the municipality. In 1969, land exchanges took place in Port McNeill, Cormorant Island (Alert Bay), and Vancouver.

The Legal Surveys, Topographic, Geographic, and Air Divisions of the Surveys and Mapping Branch continued to extend cadastral and topographic surveys, aerial photography, and mapping throughout the Province.

The Legal Surveys Division issued 1,137 sets of instructions for Crown land surveys, and field-notes or survey plans were received for 918 lots surveyed under the *Land Act* and 159 under the *Mineral Act*. Cadastral information is maintained on a day-to-day basis on 259 reference maps covering the Province.

The number of plans prepared for Land Inspectors was 2,997 in 1969, compared with an average of 2,810 annually for the previous five years.

With successful introduction of computer programme LSM 139, most Surveys and Mapping Branch programmes have been replaced by a single data-processing system.

Field work recorded by the Legal Surveys Division included 93 waterfront lease lots at Loon Lake in the Southern Rocky Mountain Trench, Lac la Hache and Young Lake in the Cariboo, Powell Lake near Powell River, and on the Similkameen River east of Princeton. Cadastral surveys covered a total of 235 rural roadside lots at Ta Ta Creek near Kimberley, three locations around Quesnel, Williams Lake, Quinsam River near Campbell River, Post Creek near Chilliwack Lake, and Ring Creek near Squamish.

A Topographic Division field crew laid out 5,500 square miles of horizontal and vertical survey control for contour mapping east of Telegraph Creek, while another project covering 1,200 square miles established control for a large-scale geological mapping project in the Savona-Nicola Valley belt. At the request of the Water Resources Service, survey control was obtained in the Taku River-Atlin Lake region, around the junction of the Dease and Liard Rivers, and along the Shuswap River below Sugar Lake.

On instructions from the British Columbia-Yukon-Northwest Territories Boundary Commission, a staff surveyor completed maintenance surveys at several locations along the 60th parallel.

For the fifth successive year, the Geographic Division set new records for map distribution, the 1969 total being 149,421, an impressive increase of 16.5 per cent over 1968. Seven new maps were published, five reprinted with substantial revision, and five land status maps reprinted without revision to restock supplies depleted by heavy demand.

Now that lithographed land-status mapping is virtually complete south of 55° N. latitude, work continues on expanding coverage north of the 55th parallel.

Having arranged lease of a high-speed aircraft for two summer months, the Air Division obtained a new record total of nearly 40,000 aerial photographs in 1969. Although poor weather severely curtailed operations in the northern reaches of the Province, this plane demonstrated characteristics of speed, range, altitude, and stability well beyond those of the existing operational aircraft.

Standard aerial photographic prints sold or loaned to the general public numbered 104,362, the Federal Government used 70,426, and Provincial Government departments and agencies took 165,614. Gross distribution was 11-per-cent higher than in 1968.

Detailed reports of the Lands Service infrastructure, including the University Endowment Lands, Personnel Office, and Mail and File Room, may be found in the following pages. An envelope inside the back cover contains indexes and key maps to current air photos and maps.

ACCOUNTING DIVISION

ACCOUNTING DIVISION

M. B. MacLean, Departmental Comptroller

The Accounting Division performs the accounting function for both Lands Service and Water Resources Service, which includes the preparation of payrolls, vouchering of invoices and travel claims, billing of accounts receivable, expenditure and revenue control, and compilation of statistical information.

Again our lease section showed a substantial increase in lease accounts with 13,050 as at December 31, 1969, compared to 11,826 at December 31, 1968. Land sales on the other hand continued to decline, 844 at December, 1968, to 483 at December, 1969. This situation, i.e., increase in leases, decline in purchases, is a result of the Department's policy of residential leases on waterfront and agricultural leasing in the Peace River with a conditional purchase option.

Three staff changes occurred during the year, two through transfers, Mr. D. Woodward and Miss J. Graham, both to the Department of Finance, and the third through the untimely death of Mrs. G. Gaunt after several months' illness.

Statistical Tables

Table 1.—Summary of Lands Service Net Revenue Collections for the Year Ended December 31, 1969

Land leases, rentals, fees, etc.	$2,553,351.23
Land sales	1,251,111.88
Sale of maps and air photos	194,810.02
Net revenue collections	$3,999,273.13

Table 2.—Comparison of Revenue Collections for 10-year Period 1960–69, Inclusive

1960	$1,714,220.41
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]

[1] Net revenue.

Table 3.—Classification of Revenue Collections for the Year Ended December 31, 1969

Land sales—			
Country lands		$997,199.22	
Town lots		265,577.96	
Surface rights, mineral claims		12,957.15	
			$1,275,734.33
Land leases, rentals, fees, etc.—			
Foreshore leases—			
Booming and log storage	$318,566.13		
Commercial (marina, etc.)	687,648.57		
Oyster	14,834.22		
Miscellaneous (foreshore protection, etc.)	222.00		
		$1,021,270.92	
Land leases—			
Grazing and (or) agriculture	$449,141.19		
Quarrying (limestone, sand and gravel)	45,989.39		
Camp-site (lodge, fishing)	11,573.09		
Home-site	1,356.58		
Residential	275,235.53		
Miscellaneous	25,110.22		
		808,406.00	
Land-use permits		6,284.00	
Licences of occupation		10,107.56	
Royalty collections		193,035.35	
Bonus bids (lease tenders and auctions)		169,713.74	
Easement collections—			
Annual rentals	$1,434.88		
Outright considerations	218,545.80		
		219,980.68	
Fees—			
Crown grant	$21,446.80		
Assignment	4,875.00		
Miscellaneous (lease, search, etc.)	10,484.00		
		36,805.80	
Sundry collections (occupational rental, survey charges, etc.)		103,184.31	
			2,568,788.36
Sale of maps and air photos—			
Legal Division		$29,549.90	
Geographic Division		66,853.72	
Air Division		111,421.97	
			207,825.59
Gross revenue for year			$4,052,348.28
Less refunds and taxes			53,075.15
Net revenue for year			$3,999,273.13

Table 4.—Comparison of Land Leases, Rentals, Fees, Etc., Revenue for 10-year Period 1960–69, Inclusive

1960	$842,413.17
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]

[1] Net revenue.

Table 5.—Comparison of Land Sales Revenue for 10-year Period 1960–69, Inclusive

1960	$806,723.54
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]

[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 by Max's Photo Studio Ltd., Kitimat.

A view of deep-sea wharf facilities being created in Kitimat Harbour by Eurocan Pulp & Paper Co. Ltd. by dredging. Eurocan mill complex is shown in centre at top of photograph.

LANDS BRANCH

December 31, 1969

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)

Pre-emptions & Reserves
(C.W. House)

Clearances
(D. Conway)

Stenographer Pool
(Mrs. B. Lawson)

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.AG., A.A.C.I., DIRECTOR OF LANDS

During 1969 there was a 9.7-per-cent increase in the total number of new applications filed with the Department. Lands Branch revenue also increased during the year to a new high record of $3,804,463. The Department's lease-develop-purchase policy, implemented in 1965, is annually increasing the number of leases being issued and correspondingly a larger percentage of revenue is attributable to lease rentals rather than to sale values.

Once again, most of the agricultural applications approved during the year were in the Peace River District, the prime area of interest to new settlers. Elsewhere in the Province agricultural applications are generally confined to the needs of established farmers and ranchers to round out holdings. It is anticipated that the extension of the Pacific Great Eastern Railway from Fort St. John to Fort Nelson will open up additional areas suitable for settlement in future years.

The large number of applications dealing with power transmission, oil and gas pipe-lines, and the investigation of a proposed products pipe-line location, indicates the manner in which resource-based industry is opening up the Province. The Pacific Great Eastern Railway is pushing north from Fort St. John to Fort Nelson and north from Fort St. James. In both cases extension of the rail-line is expected to service resource-oriented industries. One extensive status dealt with the proposed location of a transmission-line from Mica Dam to Meridian substation in the Fraser Valley. The Pacific Northern Gas Limited pipe-line between Summit Lake, near Prince George, and Prince Rupert, was completed during the year. This line has laterals to Fort St. James, Vanderhoof, Endako, Burns Lake, Houston, Smithers, Terrace, and Kitimat.

The Canadian National Railways is constructing a microwave system between Prince George and Kamloops and the Canadian Pacific Railway is expanding a microwave network in the Okanagan Valley-Kootenay area.

Under special circumstances the Department endeavours to assist municipalities to acquire, by exchange, private lands required for municipal purposes. Both the private and Crown lands involved in any such proposed exchange 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 65 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 type enabled the Crown to acquire lands within the Village of Port McNeill which will be retained for the purpose of a land assembly programme. Similarly, certain lands were acquired on Cormorant Island which will be conveyed to the Village of Alert Bay for airport purposes. An exchange involving Crown land on the south side of False Creek in Vancouver, for certain city-owned lands on Burnaby Mountain, was completed and this exchange will enable the city to replan and develop land in the False Creek area.

In response to a continued demand for Crown lots by the general public, the Department commenced work on 16 separate subdivisions throughout the Province in 1969. Most of these subdivisions were to provide waterfront lots for summer use, a number were for residential home-sites, and one subdivision was developed for industrial purposes at Nakusp.

The Department is cognizant of the need to make available suitable Crown land for recreational use, but it considers such developments must be laid out in

an orderly manner by survey and serviced by road wherever possible. Subdivisions for ski-cabin sites in the Garibaldi Mountain area and in the vicinity of Purden Lake in the Prince George area are now being planned.

A number of ski-resort applications have been handled during the year; the continuing interest of the public in ski-ing as a sport is such that ski facilities are now available throughout all parts of the Province. Of particular interest is the fact that the Crown, in co-operation with the Garibaldi Olympic Development Association, has placed under reserve all Crown lands in the vicinity of Whistler Mountain, which is the British Columbia site recommended for the 1976 Winter Olympics.

Work was started on a subdivision of waterfront lots on Young Lake, Summit Lake, Loon Lake, and North Barrier Lake during the year. A recreational subdivision was commenced at Post Creek near Chilliwack and home-site subdivisions were started in areas near Williams Lake, Quesnel, and Cranbrook.

During the year, 418 reserves were established; of this number 79 were for the use, recreation, and enjoyment of the public and the majority of the remainder for departments of Government for various purposes. Of particular interest was the establishment of 12 reserves for ecological sites and a number of map notations covering 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 which may prove to have archæological value after study.

In 1967 the Government of the Yukon Territory requested the co-operation of the Lands Branch in placing a reserve over the Canadian section of the Old Chilkoot Trail, which was used by the gold-seekers of 1898. The purpose was to perpetuate this historic route, which extends from Bennett, British Columbia, to Skagway, Alaska. Using labour from a correctional institution, clearing was started, shelters, cairns, and signs erected, and several bridges built during 1968. The work was continued during the past year. The preservation of this historical trail is a project which will be of great interest and value to hikers and recreationists of British Columbia, the Yukon Territory, and Alaska when completed.

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

Lease Section.—The number of new lease applications received increased to 5,155 from 4,453 received in 1968. This increase in application numbers, which is continuing year by year, reflects the general demand throughout the Province for Crown lands.

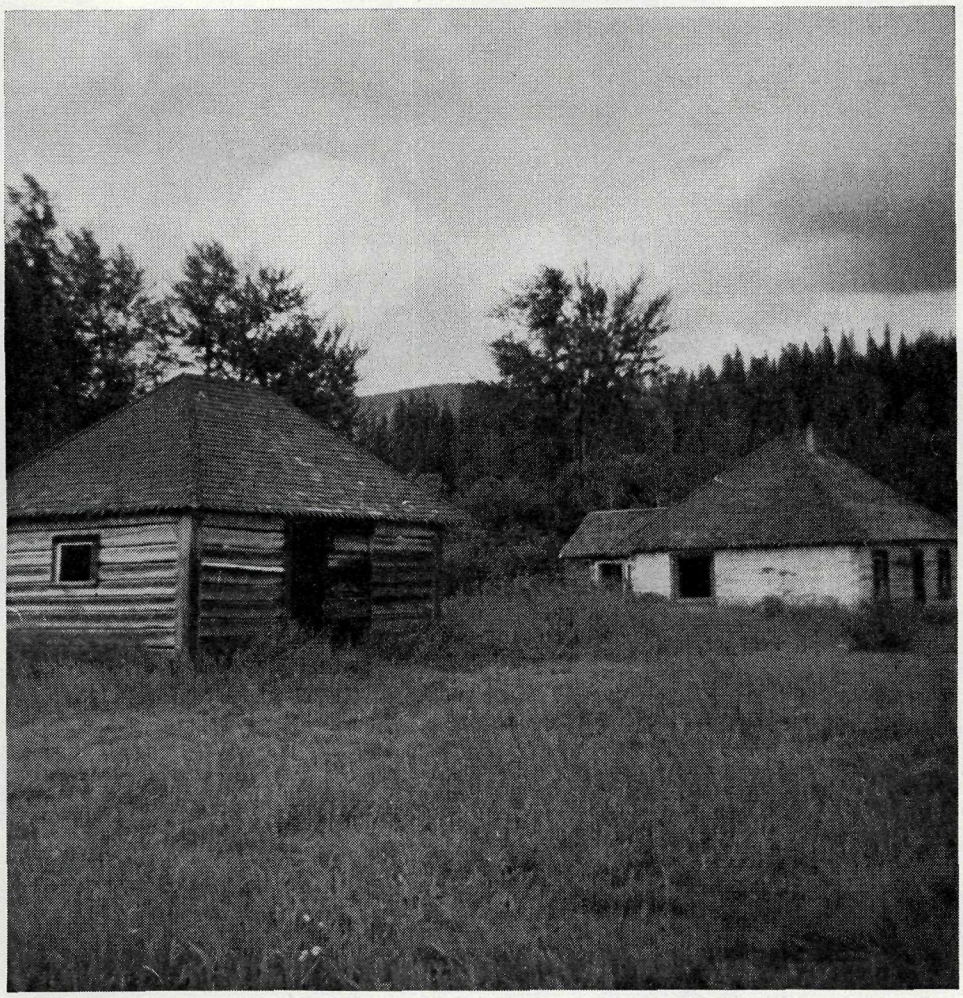
Purchase Section.—Purchase applications decreased once again over those of the preceding year, from 484 in 1968 to 290 in 1969. The continuing decrease in purchase applications was expected to result from the implementation of the lease-develop-purchase policy adopted in 1965. It is expected that very shortly this downtrend will be reversed as lessees meet the development requirements of the Department and apply for Crown grant. This Section also processes all residential leases, of which 934 were issued in 1969.

Crown Grants.—A total of 931 Crown grants was issued in 1969 as compared to 967 in 1968. As with the Purchase Section, there has been a decrease in volume since the policy change in 1965, but as lessees complete development requirements and apply for Crown grant, the work of this Section will increase. This Section also carries out clearances of reverted mineral claims, of which there were 917, and statuses of coal licences, of which there were 310 in 1969.

Pre-emption and Reserve Section.—A total of 32 pre-emption records was allowed during 1969. This type of tenure has been diminishing in importance in recent years. Reserve applications totalled 562 in 1969, up from 489 in 1968; 418 reserves were established during the year. Accretion applications, handled by this Section, totalled 25. General inquiries regarding the availability of Crown land, also handled by this Section, numbered 4,621 in 1969.

Clearance Section.—The number of clearances carried out by this Section decreased from 21,915 in 1968 to 18,133 in 1969. The number of acreage and town-lot clearances decreased, while the number of time-consuming special-status jobs increased.

Easement Section.—During 1969, 196 easements were granted, compared to 142 in 1968. The additional easements issued this year are mainly for oil and gas pipe-lines and well-sites.



Hudson's Bay Company buildings, old Fort McLeod, north end of McLeod Lake, involved in exchange of lands between the Crown and the Hudson's Bay Company.

GENERAL ACTIVITY

During 1969 a total of 41 parcels was tendered for lease; the acreage involved was 6,766.4 acres and the bonus bid revenue realized was $19,038. In addition, 367 lots were offered for lease by public auction, with 292 lots being disposed of at the time of auction, the bonus bid revenue realized therefrom being $164,701. Two hundred and eighty-three of the lots offered were waterfront properties.

Five parcels were tendered for sale in 1969, two being disposed of for $6,510. Of two lots offered for sale by public auction in 1969, one was sold for $18,000.

During the year, 175 town lots were sold, from which sales the Department realized $86,294.

The following tables indicate in detail the work carried out by the various sections of the Lands Branch in 1969.

Table 1.—Country Land Sales, 1969

	Acres
Unsurveyed	71.23
Surveyed	27,893.94
Total	27,965.17

Table 2.—Certificates of Purchase Issued, 1969

Land Recording District	Total
Alberni	17
Atlin	15
Burns Lake	6
Clinton	7
Cranbrook	17
Fernie	5
Fort Nelson	10
Fort St. John	66
Golden	2
Kamloops	18
Kaslo	2
Nanaimo	15
Nelson	34
New Westminster	5
Penticton	23
Pouce Coupe	23
Prince George	14
Prince Rupert	13
Quesnel	10
Revelstoke	9
Smithers	10
Vancouver	31
Vernon	3
Victoria	3
Williams Lake	25
Total	383

Table 3.—New Leases Issued, 1969

	Number	Acreage
Land—		
Agriculture	594	153,490.45
Hay and grazing (pasture and hay-cutting)	159	59,480.75
Quarrying (sand, gravel, limestone, etc.)	19	2,008.82
Home-site (section 78, *Land Act*)	11	99.05
Residential	934	1,529.00
Miscellaneous (resorts, service-stations, camp-sites, mill-sites, etc.)	118	6,600.20
Foreshore—		
Booming, log storage, log-dumping, etc.	92	2,501.45
Oyster and shellfish	4	50.32
Industrial (canneries, mill-sites, wharves, etc.)	8	23.46
Quarrying (sand, gravel from river beds)	2	28.70
Commercial (boat rentals, marinas, marine service-stations, etc.)	60	182.40
Miscellaneous (private wharves and boat-houses, etc.)	28	3,596.44
Totals	2,029	229,591.04

Table 4.—Temporary Tenure Leases Renewed, 1969

Number	962
Acreage	298,477.8

Table 5.—Land-use Permits Issued, 1969

Number	60
Acreage	167.43

Table 6.—Licences to Occupy Issued, 1969

Number	27
Acreage	496.26

Table 7.—Assignments Approved, 1969

Leases, land-use permits, licences of occupation	974

Table 8.—Easements Granted, 1969

	Number	Miles	Acres
Foreshore			
Submarine power cable	1	0.083	0.504
Submarine telephone cables	7	4.791	32.617
Overhead power-lines	8	0.945	8.338
Overhead telephone cables	4	0.192	1.270
Pipe-lines	4	0.494	3.260
Aerial tramway	1	0.560	0.135
Totals	25	7.065	46.124
Land			
Oil and gas pipe-lines and well-sites	86	610.365	4,489.704
Cathodic site	1	0.268	0.650
Power-lines	46	134.440	1,294.462
Telephone-pole lines	5	2.982	6.004
Microwave and V.H.F. radio-sites	4	.....	9.156
Microwave-sites and power-lines	7	6.142	48.071
Television satellite station	1	.....	0.918
Television transmitter-sites and power-lines	2	1.561	2.636
Television antenna-site and power-line	1	1.481	4.230
Television transmitter-site	1	.....	0.920
F.M. radio transmitter-site	1	.....	0.520
Radio-site and power-line	1	.....	15.894
T-bar and rope tow	1	0.398	4.570
T-bar and chair-lifts	2	1.690	9.063
Ski-lifts	3	3.971	34.126
Ski-tow	1	0.424	2.600
Water pipe-line	1	0.961	2.739
Sewer-line	1	0.240	0.440
Access road	1	0.341	2.880
Bridge	1	0.034	0.300
Totals	167	765.298	5,929.883
Licence of Occupation			
Radio-transmitter site	1	.....	0.780
Transmission-lines	2	12.405	44.840
Totals	3	12.405	45.620
Southern Okanagan Lands Project			
Water-line	1	0.103	0.747
Grand totals	196	784.871	6,022.374

In line with current Departmental policy, 98 letters of consent for the construction of access roads were issued during the year.

Table 9.—Crown Grants Issued, 1969

Purchases (country lands)	624
Purchases (town lots)	173
Pre-emptions	39
Surface rights (*Mineral Act*)	34
Public Schools Act	7
Veterans' Land Settlement Act	5
Home-site leases	3
Pacific Great Eastern Railway Company	11
Miscellaneous	35
Total	931
Certified copies of Crown grants issued	6

Table 10.—Crown Grants Issued for Past 10 Years

1960	1,399
1961	1,074
1962	1,081
1963	1,042
1964	1,163
1965	1,087
1966	1,020
1967	980
1968	957
1969	931
Total	10,734

Ten-year Average, 1,073.

Table 11.—Total Area Deeded by Crown Grant, 1969

Purchases (country lands)	69,203.67
Pre-emptions	6,139.49
Surface rights (*Mineral Act*)	1,376.96
Public Schools Act	33.46
Veterans' Land Settlement Act	1,038.36
Home-site leases	46.18
Pacific Great Eastern Railway Company	2,094.86
Miscellaneous	1,948.26
Total	81,881.24

Table 12.—Pre-emption Records, 1969

	Pre-emptions			Certificates of Improvement Issued
	Applications Received	Applications Allowed	Cancelled	
Alberni	----	----	----	----
Atlin	----	----	----	----
Cranbrook	----	----	----	----
Fernie	----	----	----	----
Fort Fraser (Burns Lake)	3	2	1	1
Fort George (Prince George)	15	8	5	7
Fort Nelson	1	1	----	----
Fort St. John	6	7	9	14
Golden	----	----	----	----
Kamloops	1	----	1	----
Kaslo	----	----	----	----
Lillooet (Clinton)	----	----	----	----
Nanaimo	----	----	----	----
Nelson	----	----	----	----
New Westminster	----	----	----	----
Osoyoos (Vernon)	----	----	----	----
Pouce Coupe	13	14	13	14
Prince Rupert	----	----	----	----
Quesnel	1	----	----	1
Revelstoke	----	----	----	----
Similkameen (Penticton)	----	----	----	----
Smithers	2	----	----	----
Telegraph Creek (Prince Rupert)	----	----	----	----
Vancouver	2	----	----	----
Vernon	1	----	----	----
Victoria	----	----	----	----
Williams Lake	2	----	----	----
Totals	47	32	29	37

Table 13.—Reserves, 1969

	Applications Received	Reserves Completed
Use, recreation, and enjoyment of the public	135	79
British Columbia Department of Highways (rights-of-way, gravel pits, bridge-sites, etc.)	122	125
Federal Government (defence purposes, wharf-sites, etc.)	99	85
British Columbia Forest Service (Ranger stations, grazing, radio sites, reforestation, etc.)	40	19
Miscellaneous (Game Branch, water-power projects, garbage dumps, school-sites, cemeteries, etc.)	166	110
Totals	562	418

General Summary

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	10-year Average
Pre-emption records issued	77	147	127	79	83	50	42	26	31	32	69
Certificates of improvements issued	27	18	22	32	29	43	48	50	42	37	35
Certificates of purchase issued	1,248	944	1,106	934	1,118	819	694	503	396	383	815
Crown grants issued	1,399	1,074	1,081	1,042	1,163	1,087	1,020	980	967	931	1,074
Total acreage deeded by Crown grants	79,766	75,486	67,989	77,354	93,579	86,166	115,917	117,672	129,307	81,881	92,512
New land sales—											
Number	1,248	944	1,106	934	1,118	819	694	503	390	383	815
Value	$857,060.67	$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	$807,218.00
Leases under *Land Act*	802	1,013	1,094	1,051	1,474	1,144	1,245	2,401	2,180	2,029	1,443
Acreage leases, *Land Act*	107,474	104,029	186,806	341,770	271,518	235,220	234,420	597,092	350,742	230,255	265,933
Temporary tenure leases renewed	103	100	93	125	317	223	376	485	716	962	350
Land-use permits	21	13	21	15	46	18	26	43	40	60	30
Licences of occupation, easements, etc.	35	7	18	13	18	12	8	22	35	27	20
Clearances of reverted mineral claims	303	282	458	418	429	456	840	889	884	917	588
Reservations for use and enjoyment of public and other purposes	550	581	547	528	397	370	304	458	380	418	453
Land Act collections	$1,649,136.71	$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	$2,505,251.00

LAND INSPECTION DIVISION

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

It will be noted by reference to the attached Table 3 that there was a slight decrease from the 1968 level in the volume of new requests processed by the Division during 1969. While this decrease is only 6.4 per cent, it is nevertheless noteworthy since it is the first time in over 10 years that a decrease in the volume of work has occurred. Although this figure remains above the 1967 level, it is only 9.3-per-cent greater than the average figure established in 1965.

Table 2 represents an analysis of inspections completed in each of the 17 Inspection Districts, as well as the yearly total outstanding at the end of each year for the five-year period ending in 1969. Also shown is the work completed at isolated coastal points by arrangement with the British Columbia Forest Service as well as work done by headquarters staff. The total of 6,137 inspections completed is down 4.5 per cent from 1968. This decline is due to delays experienced in obtaining suitable replacements for the several vacancies which occurred during the year in the field staff as well as a disruption in the work programme due to the resulting transfer of certain staff members. It is significant to note that even with these difficulties the outstanding backlog of work at year-end decreased from the level of 1968 by 2.3 per cent to a total of 936 requests outstanding as of December 31, 1969.

As had been anticipated, there was a further slight increase during the year in the proportion of applications to lease relative to other types of inspections dealt with. This is a continuation of the trend which began in 1965, following initiation by the Department of the lease-develop-purchase policy. It will be noted by reference to Table 1, which shows the types of inspections completed during the year, that of all the inspections completed, 4,603 or 75 per cent of the total fell into these categories. This ratio stood at 73 per cent in 1968 and at only 53.4 per cent in 1965. Applications to lease and renewal of leases other than foreshore totalled 4,209 or 68.4 per cent of all inspections completed. A policy change instituted by the Department in 1969 makes it no longer necessary to undertake a field inspection following the initial three-year leasehold tenure period. For this reason it is expected that there will be a decline in 1970 in the number of examinations made which fall in these lease categories.

As in past years, the Inspection Division examined properties and submitted appraisal reports for many Government departments and agencies. Early in 1969 the Land Inspector located at Nelson was called on to assist the Department of Highways to appraise land being acquired in connection with the Libby Dam Project. Also, the Land Inspector at Quesnel was appointed as a member of the Technical Study Team on the special sale area and served as chairman of that group for a period of five weeks until the study was completed and the final report submitted. In addition, properties were examined and reports submitted for the Southern Okanagan Lands Project, *Veterans' Land Act,* Pacific Great Eastern Railway, British Columbia Hydro and Power Authority, British Columbia Forest Service, Department of Social Welfare, Department of Highways, Public Utilities Commission, and the Capital Improvement District Commission.

There was a significant decrease during the year from the 1968 level in the number of new inspection requests received in the Peace River region. This decrease is mainly due to the previously mentioned policy change which has removed the need to inspect areas held under lease for residential and agricultural purposes

following the initial three-year term of the lease. The most pronounced decrease, amounting to 33.9 per cent, occurred in the South Peace River area. Due to this drop in new inspection requests received and also as a result of being able to maintain almost the same work output as in 1968, the outstanding backlog of work at year-end in the Peace River area was at the lowest level since 1965.

Although there were slightly fewer inspections completed in 1969, there was a very noticeable increase in the average size of the areas for which applications were made. In the North Peace area a total of 650,000 acres of land was examined, 300,000 acres of which was involved in a land-use study made of a block of land straddling the Alaska Highway and located approximately 10 miles south of Fort Nelson. This study was undertaken in anticipation of a demand for land which is expected to take place when work on the Pacific Great Eastern Railway from Fort St. John to Fort Nelson is completed.

Due to the fact that 1969 was the third consecutive poor crop year experienced in the Peace River region, coupled with the continued decrease in availability of land suitable for agricultural development, it is anticipated that there will be a slight decline in the demand for agricultural land in 1970. With improved road conditions giving access to new recreational areas, there is an increased interest shown in summer-home site applications, particularly in the area south of the Peace River.

The Prince George Inspection District was increased in size slightly by the addition early in March of a small portion of the Kamloops Inspection District covering the McBride-Valemount area. The transfer later in the year of a small portion of the Vanderhoof Inspection District to the Burns Lake District tended somewhat to equalize the work load in the Prince George-Vanderhoof area and as a result the number of new inspection requests processed during the year was almost identical to the 1968 level. As in the previous year, the majority of land applications were made by local residents.

A number of permanent forest reserves was established in the Prince George-Vanderhoof area during 1969, and while the total acreage involved in these reserves is substantial it is not felt that the effect on the inspection work load will be too significant. In the Prince George District only 10 per cent of the inspections completed in 1969 covered areas which are now located within these permanent forest reserves.

Three land-use surveys were undertaken in the Prince George Inspection District during the year. One area was located in the vicinity of Penny, while the other two involved examinations of land located along Highway No. 16, from Prince George to the Alberta border. Some work was done in the Vanderhoof District on a land-use study to determine the agricultural potential of an area located between Fort St. James, Grand Rapids, and Stuart and Pinchi Lakes. It is anticipated that the study of this area will be completed early in 1970.

The extension of the Pacific Great Eastern Railway from Fort St. James to Takla Lake will have a decided impact on the demand for land in this region. It is expected that the demand for home-sites, as well as commercial and industrial use, will be the most pronounced.

There has been a continued increase in interest shown in summer-home sites in the Prince George-Vanderhoof area. Development of a 48-lot subdivision fronting on Summit Lake was undertaken during the year and it is anticipated that the lots which are to be provided will be available for disposition in 1970. As a result of the establishment of the large permanent forest reserves which encompass several major lakes within this area of the Province, it would appear that there will

be a reduction in planning and development of recreational subdivisions by the Lands Branch.

The volume of new inspections requests processed in the Burns Lake, Smithers, and Prince Rupert Districts during the year increased by 23.3 per cent over 1968. The biggest change took place in the Burns Lake and Prince Rupert Inspection Districts, while the work load in the Smithers District was almost identical to the 1968 level. A slight decline in the total work load toward the 1968 level is predicted for this area of the Province in 1970.

A land-use study was made of a large area of approximately 19,500 acres of land located within the Nadina Valley west of Francois Lake in the Burns Lake District. This area is an important winter range for moose and the study was undertaken to determine the highest and best use of the land following a request from the Fish and Wildlife Branch for a multi-use reserve covering this key area.

A 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, has been further delayed due to the existence of mineral claims. There are now 27 ski cabins, a ski lodge, two television repeaters, and two ski tows located in the area, but to date the ski club has not been able to obtain quitclaims from the holders of the conflicting mineral claims. The territorial claims made by the Kitwancool Indians have not as yet been resolved and continue to complicate the processing of applications located in Ranger District No. 5.

Highway No. 16 is rapidly approaching completion as a paved highway between Prince George and Prince Rupert and, by 1971, Prince Rupert, Terrace, and Kitimat should be linked by pavement with the rest of the Interior. The construction of a bridge over the Nass River in the vicinity of Meziadin Lake, as well as the construction of the remaining few miles of road, will make Stewart and Cassiar accessible from Highway No. 16. With these improvements in road access it is anticipated that there will be a significant increase in the Prince Rupert Inspection District during the next few years in applications for residential, commercial, and industrial purposes.

A large dredging operation in Kitimat Harbour, undertaken mainly to provide deep-sea wharf facilities for the new pulp-mill developed by Eurocan Pulp & Paper Co. Ltd., has been completed. This is the first stage of a project designed to triple the deep-sea berth capacity of Kitimat Harbour. (*See* photo on page 19.)

Compared to the 1968 level, there was a marked decrease of 37.8 per cent in the number of new land applications received in the Quesnel Inspection District. This is largely due to the inhibiting influence of the special sale area requirements as well as the establishment during the year of several large permanent forest reserves which cover a major portion of the Inspection District. Due to these factors, there will be much reduced activity in land applications in the Quesnel area during 1970, but in view of the method of dealing with applications for agricultural land located within the special sale area, it will be necessary to spend much more time completing each inspection.

In the Central Southern Cariboo area, which takes in the Williams Lake and Clinton Land Inspection Districts, the demand for lakefront lots is much in excess of the supply. Applications for summer-home site use showed a marked increase over the 1968 level, although the total of all new inspection requests covering all types of applications decreased by 11.3 per cent. In the Clinton District, a total of 125 lakefront residential sites was alienated by way of public auction. Competitive bidding for the right to acquire these summer-home sites on a leasehold basis was strong and, in total, $119,475 in bonus bids were paid. It is interesting to note that 83 per cent of the successful bidders were Lower Mainland residents,

11 per cent were residents of the Cariboo area, and only 6 per cent gave addresses indicating residence in the United States. There is a continued strong demand also for permanent-home sites throughout this portion of the Cariboo. This demand is expected to increase along with further growth in the population of the area.

Inspection requests received in the Kamloops Land Inspection District were down substantially from the high record established in 1968 to a figure approximating the five-year average for the district. This reduction is chiefly due to the boundary change which involved a transfer of a portion of the district to the Prince George Inspection District. The historical conflict which has existed between ranchers and all outside interests continues to present the greatest problem in land alienation in the Central Interior. This conflict has recently been vividly illustrated in the Highland Valley area of the Kamloops District, where applications covering large areas of grazing land have been submitted by mining operations. Frequently the areas most in demand for mining, home-site, and other industrial use cover valley bottoms and open slopes which are usually of the greatest value to the rancher for grazing.

The work load in the Kelowna District remained static during the past year, but at a level well above the five-year average. Applications to fill foreshore, as well as applications made under section 102 (2) of the *Land Registry Act* to obtain accreted lands, remained at a high level. In recent years, interest in these two categories has been stimulated by new health regulations which have made certain older lakefront lots unsuitable for residential development due to inadequate size as well as by a desire to legalize areas previously filled and occupied in trespass.

A noticeable increase in land values, which became evident in 1968, continued throughout the Kootenays. As a result of the rapid growth in population which is taking place in this portion of the Province, particularly in the East Kootenays, it can be expected that there will be a greatly increased demand for land in the residential and smallholding categories during 1970. Of the inspections completed during the past year, 28 per cent were the result of applications made for permanent- or summer-home site use.

In the two Lower Mainland Inspection Districts, the total work load decreased by 9 per cent. The types of examinations completed do not indicate any particular trend or development, but with the continued population growth in this region of the Province the demand for permanent- and summer-home sites is expected to remain at a high level. Of the total inspections completed during the year in the Vancouver and New Westminster Land Inspection Districts, 34 per cent fell in these two categories. The areas receiving the greatest attention for these home-site uses are the Sechelt Peninsula, as well as the Nelson and Bowen Island areas of the Vancouver District, and the Harrison Lake area of the New Westminster District.

A portion of the Vancouver District covering Cortes and Read Islands was transferred to the Courtenay Land Inspection District early in the year. Even with this addition, the number of new requests received in the Courtenay District decreased by 23.8 per cent from the 1968 level. As has been the pattern in previous years, the large majority of inspections completed were inspections of foreshore areas. Applications for permanent- and summer-home site use also remain at a high level. Development on the north end of the Island is continuing, and further expansion of the work load in this area is anticipated. Two of the main developments which took place during the year were commencement of construction of the cedar mill at Tahsis and the announced plan for development of the copper mine on Rupert Inlet near Port Hardy.

Wharf approach and mooring-float on foreshore lease, Gowlland Harbour, Quadra Island.

A 90.6-per-cent increase in work load over 1968 was experienced in the Victoria Land Inspection District. This increase in volume is chiefly due to an unusually large number of requests received for review of a block of summer-home site leases located on Valdes Island, and is not an indication of any significant trend or development taking place within the district.

TRAINING

As a result of resignations and promotions, there are now only five Land Inspectors, together with the Chief and Assistant Chief Land Inspectors, who are accredited as appraisers with the Appraisal Institute of Canada.

Ten Land Inspectors and eight Deputy Land Inspectors have successfully completed the required course material in the Appraisal Education programme and most of these people are now actively engaged in finalizing the necessary demonstration appraisal reports required to meet accreditation standards. The three Land Inspectors taken on staff in July are now enrolled in the new Appraisal I course which began in 1969 and which became a two-part course consisting of the old

Appraisal I material, plus an economics section designed to provide an introduction to principles of economics. One Land Inspector, in addition to the Chief Land Inspector, has responded to an appeal made by the Appraisal Institute to obtain further professional advancement and has enrolled in the background course in economics. Accredited members who successfully complete this course will be issued with a certificate of completion. Two Land Inspectors and three Deputy Land Inspectors are studying on their own with a view to rewriting final appraisal examinations in the spring.

Two Land Inspectors have completed the three-year Public Administration Course. One Land Inspector is enrolled in the first year of this course, while one other Land Inspector and the Assistant Chief Land Inspector are now in the second year of the course.

Annual zone meetings were again held in March at Kamloops, Prince George, and Fort St. John.

STAFF CHANGES

The work programme during the year was complicated by several changes in the location and employment of staff, and was climaxed in mid-December by the tragic and untimely death of Mr. R. L. Cawston as a result of a hunting accident. Mr. Cawston had served with the Forest Service for a number of years prior to joining the Inspection Division on August 16, 1965. His death is not only a great loss to the Department but to the Service in general.

Mr. G. A. Rhoades, former Land Inspector, Victoria, was promoted to the position of Administrative Assistant, Land Administration, effective May 1, 1969.

The following resignations occurred for the reasons noted: Mr. J. R. Nijhoff, April 1, 1969 (employed with Department of Highways, Victoria); Mr. D. M. Thom, April 15, 1969 (employed with a private appraisal firm, Vancouver); Mr. L. R. Paynton, May 23, 1969 (to manage his own business in Burns Lake).

These vacancies resulted in a number of transfers and promotions: Mr. J. A. Esler from Williams Lake to Victoria, in charge, May 12, 1969; Mr. F. G. Edgell from Smithers to Williams Lake to become Land Officer 3, in charge, August 1, 1969; Mr. L. M. Warner from Prince Rupert to Smithers, in charge, September 1, 1969; Mr. J. P. Egan from Fort St. John to Prince Rupert to become Acting Land Officer 2, in charge, effective August 18, 1969; Mr. D. E. Jaffray from Kamloops to Vanderhoof to become Acting Land Officer 2, in charge, effective June 1, 1969; Mr. R. Gilmour from Kelowna to Vancouver to become Land Officer 4, in charge, effective July 1, 1969; Mr. G. Huva from Quesnel to Kelowna, in charge, effective August 1, 1969; Mr. R. A. Cullis from Williams Lake to Quesnel to become Acting Land Officer 2, in charge, effective August 1, 1969; Mr. T. J. Todd from Prince George to Burns Lake to become Acting Land Officer 2, in charge, effective August 1, 1969.

As a result of the aforementioned three resignations, the following personnel were taken on staff on July 1, 1969: Mr. L. A. Gosselin, Land Officer 1, Kamloops; Mr. D. M. Sayers, Land Officer 1, Williams Lake; Mr. D. B. Lymburner, Land Officer 1, Prince George.

As of December 31, 1969, there were two vacancies on staff—one being a Technical Land Officer position and the other a Land Officer position. A full staff complement is 21 Land Officers and 12 Technical Land Officers, in addition to the Chief and Assistant Chief Land Inspectors.

STATISTICS

Table 1 represents a summary of the number and type of inspections completed in the Province by this Division during 1969. Table 2 represents a com-

parison 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 1965 to 1969, inclusive.

Table 3 represents an analysis of requests for inspections processed by this Division for the years 1965 to 1969, inclusive.

Table 1.—Types of Inspections, 1969

Purchases—	
Agriculture (other than grazing)	80
Access (roads, etc.)	13
Commercial (resorts, service-stations, hotels, airfields, etc.)	26
Community (cemeteries, church sites, parking areas, etc.)	9
Grazing (pasture, range)	15
Home-sites (permanent)	96
Industrial (mill-sites, power-sites, manufacturing plants, etc.)	60
Summer home or camp-site	6
Woodlots or tree-farms	1
Others	3
Leases—	
Land—	
Agriculture (other than grazing)	1,000
Commercial (resorts, service-stations, hotels, airfields, etc.)	123
Community (parks, cemeteries, dump-sites, etc.)	31
Fur-farming	2
Grazing (pasture, range, hay-cutting, etc.)	242
Home-sites (section 78 of the *Land Act*)	8
Home-sites (permanent, other than section 78 of the *Land Act*)	435
Industrial (mill-sites, power-sites, manufacturing plants, etc.)	31
Summer home or camp-site	644
Quarrying (sand, gravel, limestone)	45
Reviews (rental and (or) diligent use)	1,643
Others	5
Foreshore—	
Booming and log storage or log-dumping	107
Commercial (boat rentals, marine service-stations, wharves, etc.)	71
Industrial (mill-sites, canneries, factory-sites, wharves, etc.)	15
Quarrying (sand and gravel from river beds)	3
Oyster and shellfish	13
Private (floats, boathouses)	6
Reviews (rentals and (or) diligent use)	175
Others	4
Land-use permits	75
Licence of occupation	29
Easements and (or) rights-of-way	11
Pre-emptions—	
Applications	13
Annual inspections (including applications for Crown grant)	150

Table 1.—Types of Inspections, 1969—Continued

Subdivisions—	
Valuations	29
Survey inspection	3
Plans cancellation	2
Proposals (lakeshore, residential, etc.)	27
Others	2
Reserves—	
Grazing	3
Gravel pits	2
Recreational	67
Others	8
Veterans' Land Act	2
Doukhobor lands	3
Southern Okanagan Lands Project	5
Pacific Great Eastern Railway	3
Department of Social Welfare	1
Other agencies—	
British Columbia Hydro and Power Authority	8
British Columbia Forest Service	1
Public Utilities Commission	3
Department of Highways	1
Capital Improvement District Commission	1
Miscellaneous inspections—	
Assignments	36
Delinquent accounts	18
Escheats Act	1
Lake reconnaissance	45
Land-use surveys	11
Land revaluations of special nature	73
Protests	40
Section 53 (2), *Land Act* (verifying improvements)	350
Section 65, *Land Act* (free grants)	1
Section 78, *Land Act* (*re* compliance with provisions of)	27
Section 131B, *Land Act* (cases of doubt regarding inclusion of body of water in Crown grant)	9
Trespass (land)	28
Trespass (water)	56
Quieting Titles Act	5
Section 102 (2), *Land Registry Act*	17
Others	59
Total	6,137

Table 2.—Analysis of Inspections Completed and Inspections Outstanding at Year-end for the Years 1965 to 1969, Inclusive

Land Inspection District	Examinations Made during—					Outstanding at End of—				
	1965	1966	1967	1968	1969	1965	1966	1967	1968	1969
Burns Lake	136	318	173	171	190	151	27	32	8	56
Clinton	235	226	266	271	462	35	40	64	212	89
Courtenay	293	303	274	353	325	32	15	36	61	24
Fort St. John	582	1,129	1,066	1,039	858	230	146	180	162	157
Kamloops	482	515	423	530	428	50	72	52	60	58
Kelowna	201	185	216	275	267	26	15	39	43	59
Nelson	278	307	250	324	369	63	37	45	16	9
New Westminster	242	274	245	247	303	61	34	7	49	23
Pouce Coupe	454	609	610	607	513	121	92	45	67	27
Prince George	551	423	433	387	406	52	68	27	52	74
Prince Rupert	67	194	180	165	146	85	34	38	26	74
Quesnel	173	191	241	266	185	51	38	33	32	14
Smithers	317	351	212	272	244	178	14	23	25	57
Vancouver	250	233	259	353	263	30	57	31	33	58
Vanderhoof	236	330	327	401	341	35	49	40	35	61
Victoria	156	156	189	137	252	32	46	4	16	48
Williams Lake	530	415	492	620	567	33	38	74	48	41
Headquarters	13	13	28	1	2	-----	-----	-----	-----	-----
Forest Service	70	20	36	9	16	16	14	11	13	7
Totals	5,266	6,192	5,920	6,428	6,137	1,281	836	781	958	936

NOTE.—These figures include pre-emptions.

Table 3.—Analysis of Requests for Inspection Processed by Land Inspection Division for Years 1965 to 1969, Inclusive

District	New Requests Received during—					Per Cent Change, 1969 over 1968	Per Cent Change, 1969 over 1965
	1965	1966	1967	1968	1969		
Burns Lake	287	194	180	147	238	+61.9	−17.1
Clinton	241	230	290	419	339	−19.1	+40.7
Courtenay	292	286	295	378	288	−23.8	−1.4
Fort St. John	708	929	986	924	840	−9.1	+18.6
Kamloops	457	532	402	537	426	−20.7	−6.8
Kelowna	190	173	239	279	283	+1.4	+48.9
Nelson	312	281	258	295	362	+22.7	+16.0
New Westminster	267	246	241	266	277	+4.1	+3.7
Pouce Coupe	450	506	508	569	376	−33.9	−16.4
Prince George	457	426	375	396	414	+4.5	−9.4
Prince Rupert	108	143	184	153	194	+26.8	+79.6
Quesnel	162	172	222	259	161	−37.8	−0.6
Smithers	366	187	221	274	276	+0.7	−24.6
Vancouver	256	260	233	355	288	−18.9	+12.5
Vanderhoof	168	320	307	386	354	−8.3	+110.7
Victoria	172	170	147	149	284	+90.6	+65.1
Williams Lake	503	420	524	591	557	−5.8	+10.7
Headquarters	13	13	28	1	2	+100.0	−84.6
Forest Service	57	27	36	11	18	+63.6	−68.4
Totals	5,466	5,515	5,676	6,389	5,977	------	------

Average change for 1969 over 1968 for Province is −6.4 per cent.
Average change for 1969 over 1965 for Province is +9.3 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:—

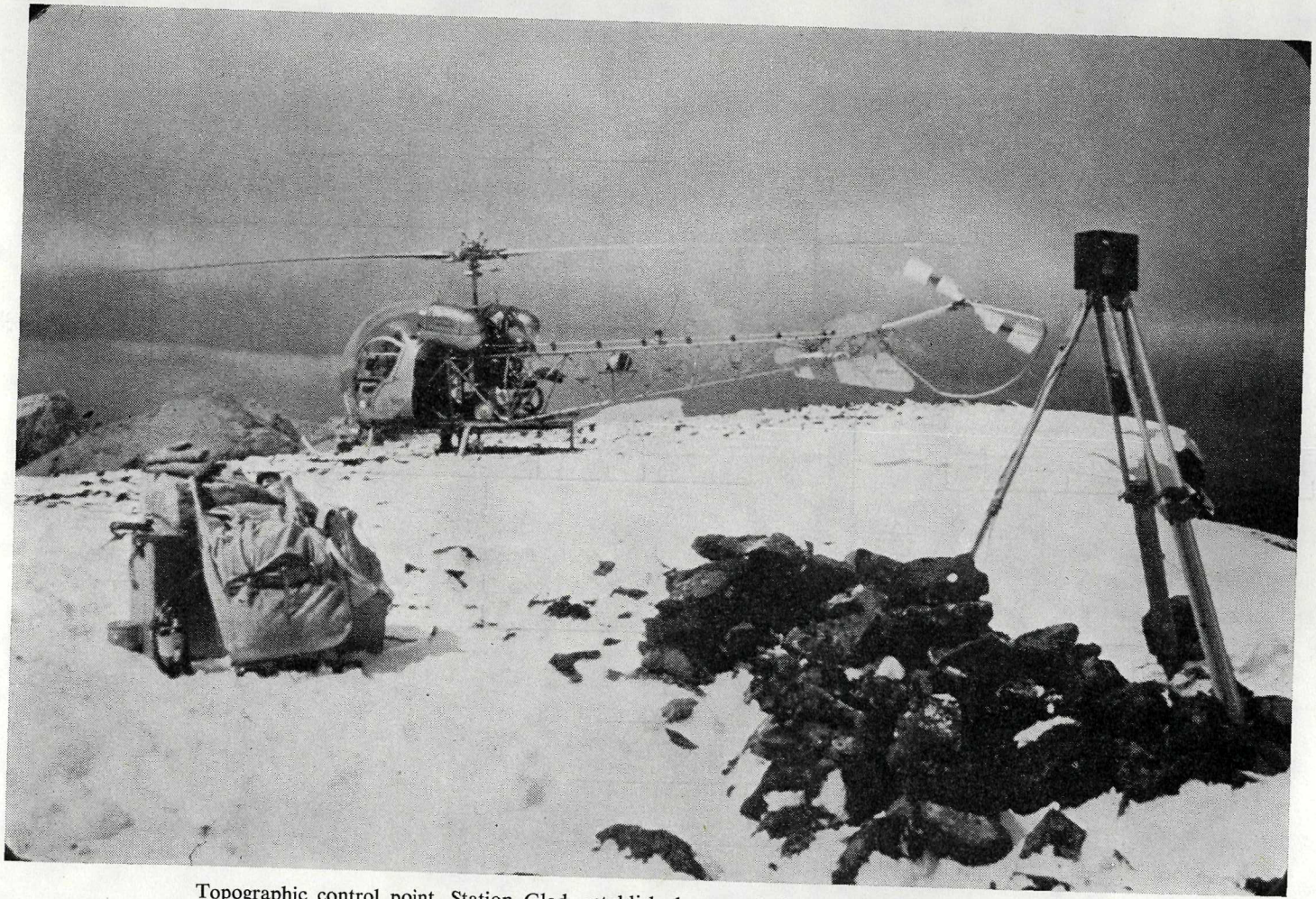
I. Administration.—General co-ordination of the four divisions of the Branch, being Legal Surveys, Geographic, Topographic, and Air; delineation and maintenance of boundaries under the Provincial Boundary Commissioner—namely, (*a*) Alberta-British Columbia Boundary and (*b*) British Columbia-Yukon-Northwest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

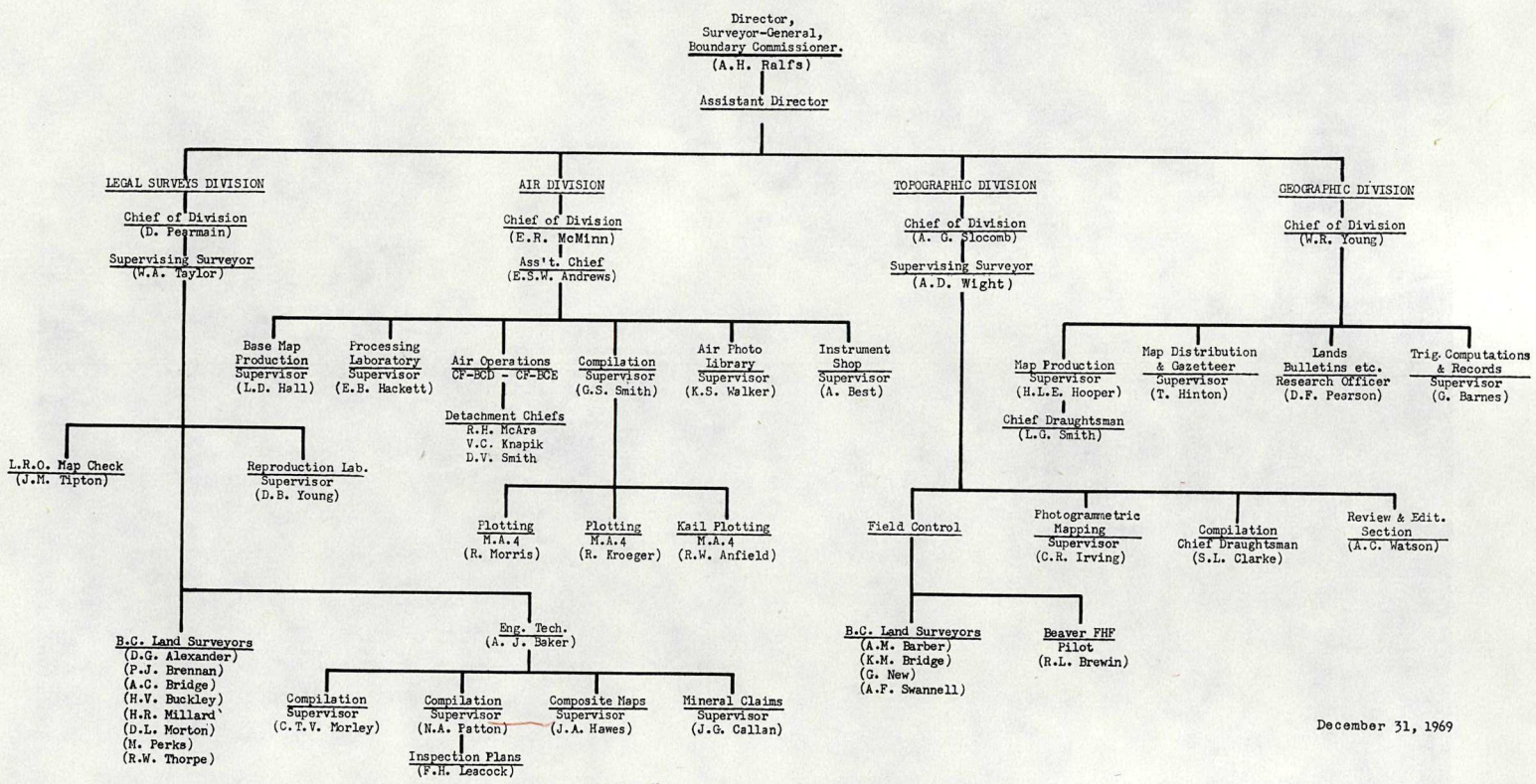
V. Air Division.—Aerial photographic operations involving maintenance and operation of two aircraft; photographic processing, air-photo distribution, and Provincial air-photo library; compilation of interim base maps, primarily for the forest inventory; air-photo control propagation; instrument-shop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



Topographic control point, Station Glad, established west of Cold Fish Lake, Spatzizi Plateau.
Equipment ready to move after first snowfall of year, August, 1969.

ORGANIZATION CHART

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



December 31, 1969

SURVEYS AND MAPPING BRANCH

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

Because portions of the northern boundary of the Province had not been re-examined or maintained since their original demarcation in the middle and late 1940's and a short segment had not been retraced for more than 60 years, the British Columbia-Yukon-Northwest Territories Boundary Commission decided to make a maintenance survey of the boundary line in 1969. A. F. Swannell, B.C.L.S., was loaned by the Topographic Division to carry out instructions issued by the Commission. In brief, these were to supervise defoliant spraying of approximately 160 miles of boundary line; clear the vista and restore monuments on either side of road and railway crossings; retrace the boundary between Monuments 120 and 132 originally demarcated by J. N. Wallace in 1908; and finally to investigate an apparent anomaly between Monument 600 and Monument 1, where the Liard River flows across the 60th parallel into the Northwest Territories.

Although the field crew experienced considerable difficulty with poor visibility, rain, and snow in August on the retracement survey, all aspects of the assignment were concluded successfully. After checking several courses and angles and line brushing at the Liard River crossing, the crew re-opened the boundary vista and checked, restored, and in two cases, replaced monuments at boundary crossings on the Alaska Highway, and the Cassiar, Atlin, and Haines Roads. The skyline at Bennett Lake railway crossing was found to be adequately clear without reslashing. While retracing Wallace's section in the rugged mountains between Mount Nevin and the Blanshard River, Swannell recovered a well-preserved picket marker which had been placed on the line more than six decades earlier.

A ground check confirmed that the spray defoliant, Tordan 101, dropped at low level by helicopter on the relatively inaccessible sections of the line, had been placed very accurately. This particular spray, while it will kill woody growth, is non-toxic to birds, animals, fish, and grass.

During 1969 the general purpose computer programme LSM 139 was developed to the stage where it replaces all the previous Surveys and Mapping Branch programmes, except for LTC 116 (reduction of geodimeter measurements), and aerotriangulation strip and block adjustments used by the Photogrammetric Section. The LTC 116 programme probably will be integrated into the LSM 139 system during 1970. Several improvements in data handling have been effected. For example, under the former " Cosmos " and " Bride " programmes and level network adjustment programme LTC 122, it had been necessary to manually pre-sort information on the punch-card data sheets. Data may now be presented in any order and the sorting is done automatically by the LSM 139.

Besides being used by all Divisions of the Surveys and Mapping Branch the LSM 139 programme has been adopted by the Water Resources Service, the Engineering Services Division of the Forest Service, and the Department of Highways.

The reproduction section of Legal Surveys Division continued to serve the needs of the Surveys and Mapping Branch and several other departments for diazo prints, Xerox copying, and photographic and multilith reproductions. In its first full year of operation, the 105-mm. camera proved to be so versatile, and demands for its services so great, that during November and December it was operated for 16 hours a day. The camera has been invaluable for making miniaturized archival copies of

plans, diagrams, and maps. It has also demonstrated an ability to make extremely accurate reductions or enlargements for map-compilation purposes.

During the year, the Air and Topographic Divisions of the Branch experimented with new methods of mapping in an attempt to discover an alternative to the slotted-template laydown. A programmed analytical approach was tested, but so far has not proved satisfactory.

The Branch also has been following progress in the development of the new orthophoto method of mapping, which holds considerable promise of useful application in this Province. The end map-sheet product would be an air-photo mosaic completely rectified to the required map scale, on which would be superimposed contours, roads, lot structure, and any other desired element of culture. Orthophoto maps obviously would be of tremendous value and offer a wealth of information to all resource fields of interest such as forest inventory, highway location, traffic engineering, mining and geology, water investigation, land inspection, regional planning, and many others. While sophisticated equipment to make such maps is on the market, all involve a photographic scanning process which, in the rougher terrain of British Columbia, would take much longer per photographic overlap than it would in flatter areas. A new analytical procedure is currently being developed which is expected to very much speed up the process so that it becomes economically acceptable.

A large-scale mapping project completed during the past year mapped an area of 27,700 acres in the Kootenay River Valley. Sixty-three topographic map-sheets compiled at a scale of 1 inch to 200 feet, with a 5-foot contour interval, covered the area from the International Boundary north to the Bull River. The mapping, which represents the area in British Columbia required for the Libby Reservoir, was initiated by a request from the Water Resources Service to comply with the terms of an agreement of the Columbia River Treaty. The addition of the cadastral surveys plotted from field-notes and field-survey ties extended the use of the mapping from engineering requirements to land statusing. The townsite of Wardner, at the northern end of the reservoir, was mapped at 1 inch to 100 feet, with a contour interval of 2 feet to facilitate detailed study of the area. Copies of this mapping have been supplied for use by all Government departments engaged in the preparation of the Libby Reservoir.

Lithographed maps distributed to other departments and the public increased for the fifth consecutive year to reach a total of slightly under 150,000 sheets. The value of accurate, up-to-date maps may best be reflected through the importance attached to them by those directly concerned with resources development and administration and by the public at large. Whether their purpose is to locate an industrial plant or just to show a fishing lake in the mountains, maps must inspire confidence and trust in the users. Approximately 80 per cent of all lithographed maps produced by the Surveys and Mapping Branch are distributed to the general public, the other 20 per cent are taken by Government departments. External uses and benefits, therefore, are substantial.

The 259 departmental reference maps provide a current visual record of applications, surveys, and alienation under the *Land Act* and *Forest Act*. On the Lower Mainland and south-eastern Vancouver Island, where the population density is high and cadastral and status details are complex, reference maps are printed at 4 inches to 1 mile or 2 inches to 1 mile scale. Most other settled parts of the Province are covered at 1 inch to 1 mile, except the lightly populated northern quarter, where mapping at 1 inch to 2 miles scale is still usually adequate.

Besides the reference map series, which covers the whole Province, the Surveys and Mapping Branch maintains more than 400 large-scale composite sheets for selected areas, mainly around population centres. The composite map series shows the cadastral system or lot structure and includes all subdivisions made under the *Land Registry Act*. They are of tremendous importance to many Government departments and the public, but in the past year or two, with the advent of the regional district concept, they constitute one of the first tools required by the aforesaid districts. At this time, Surveys and Mapping Branch is busy correlating all of the activity in this special field of mapping to ensure that there is no duplication of effort and expense by various Government departments, private mapping concerns, regional districts, and municipalities which are each involved in making or acquiring these maps.

LEGAL SURVEYS DIVISION

D. PEARMAIN, CHIEF

The Legal Surveys Division, under the direction of the Surveyor-General, is responsible for cadastral surveys of all Crown lands of the Province. This entails the issuing of instructions to the land surveyors engaged to make each survey and supplying them with copies of field-notes and plans of adjoining or adjacent surveys. After the completion of the survey, the returns are forwarded to this office for examination and acceptance. In these returns are all right-of-way surveys, including those for highways, railways, and transmission-lines. This year, 1,137 sets of the above instructions were issued, as against 1,195 during 1968.

During the year, 583 sets of field-notes or survey plans covering the survey of 1,077 lots were received in this office and duly indexed and checked. Of these surveys, 918 were made under the *Land Act* and 159 under the *Mineral Act*. At the present time there are approximately 101,598 sets of field-notes on record in our vaults.

There were 459 plans received from land surveyors covering subdivisions and rights-of-way surveys which were made under the *Land Registry Act*. These plans were duly indexed and checked, and certified copies deposited in the respective Land Registry Office.

In order that a graphic record may be kept of alienations of both surveyed and unsurveyed Crown lands together with all reserves, a set of 259 reference maps covering the whole of the Province must be maintained. These show all cadastral surveys which are on file in the Department, and are kept up to date by new information as it accrues from day to day. Prints are available to the public. (*See* Indexes 1 to 7 in the envelope attached to the back cover of this Annual Report.)

All applications to purchase or lease Crown lands on foreshore which are received by the Lands Branch and all applications to purchase Crown timber received by the Forest Service are channelled through this Division for clearance. The orderly processing of these applications requires that an exhaustive status be made from the reference maps, official plans, and Land Registry Office plans. From the reference maps, together with other information and facilities maintained by this Division, it is possible to give an up-to-the-minute status of any parcel of Crown land in the Province.

This Division co-operates with the other departments of Government by preparing and checking legal descriptions which they require. Those assisted in this way were the Attorney-General's Department (descriptions of Small Debts Courts), the Department of Agriculture (descriptions of disease-free areas and pound districts), the Forest Service (descriptions of tree-farm licences and working circles), and the Lands Branch (descriptions for gazetted reserves, etc.). During the year 589 of the above descriptions were prepared and checked.

REPRODUCTION SECTION

The Legal Surveys Division, through this section, continues to supply a service to all departments of Government and to the public, as well as supplying all prints and photostats, etc., required by the Surveys and Mapping Branch. The total number of diazo prints made during the year was 429,047, in the preparation of which 306,532 yards or 174 miles of paper and linen were used, plus 75,000 mis-

cellaneous sized, cut sheets. The number of photographic reproductions made was 48,991. The number of Xerox copies made was 301,096.

Of the 429,047 diazo prints made, 53,889 were for the Surveys and Mapping Branch, 79,415 for other branches of the Department of Lands, Forests, and Water Resources, 277,889 for other departments of Government, and 17,794 for the public. Likewise, of the 48,991 photographic reproductions made, 9,634 were for the Surveys and Mapping Branch, 10,101 for other branches of the Department, 29,248 for other departments of Government, and 8 for the public.

The multilith machine turned out 1,469,147 copies during the year.

The 105-mm. camera has turned out a tremendous amount of work during the year. The miniaturization programmes of the Department of Highways and the Department of Public Works are proceeding most satisfactorily. During the last two months of the year, a night shift has been doing archival work for the Department of Highways.

COMPOSITE MAP SECTION

This Section is responsible for the compilation and fair drawing of composite maps, mostly on a scale of 500 feet to 1 inch, of the more densely subdivided areas of the Province, and especially where they occur in unorganized territory. (*See* Index 3 inside back cover.)

During the year, 134 composite map-sheets were completed. These covered areas requested by the Chief Land Inspector and the Surveyor of Taxes; also 22 reference maps were recompiled and redrawn during the year.

LAND EXAMINATION PLANS SECTION

This Section is responsible for the preparation of plans for the use of the Land Inspectors in their examination of applications for Crown lands. These plans are a consolidation of all the information available in this Department and pertinent to the applications requiring inspection. A synopsis of the work accomplished by this Section during the past six years is as follows:—

Year	Plans Prepared	Year	Plans Prepared
1964	2,827	1967	2,753
1965	2,212	1968	3,450
1966	2,808	1969	2,997

LAND REGISTRY OFFICE PLAN CHECKING SECTION

This Section supplies a service to the Land Registry Offices at Victoria, Vancouver, Kamloops, Nelson, Prince George, and Prince Rupert by giving a thorough and complete mathematical check to plans tendered for deposit in the said offices. This mathematical check is accomplished through the use of the electronic computer which is available to this Division.

During the year, 3,340 plans received this check as compared to 3,182 in 1968, 2,649 in 1967, 2,463 in 1966, and 2,436 in 1965.

GENERAL

The receiving and distribution of survey-posts, which are stored at 859 Devonshire Road, has operated smoothly and efficiently. The following synopsis shows the quantities of posts shipped during the past year and to whom:—

	Standard Pipe	Driveable Pipe	Standard Rock	B.C.L.S. Bars	Driveable Pin	Post Caps	Anchor Plates	2½-inch Bar
Purchased by private surveyors from headquarters	35	35	213	.....	289	1,065	.....	147
Supplied to Departmental surveyors	70	18	57	1,250	890	288	6	33
Shipped to Government Agents for resale	.....	.....	392	100	4,254	7,554	230	300
Totals	105	53	662	1,350	5,433	8,907	236	480

Summary of Office Work for the Years 1968 and 1969, Legal Surveys Division

	1968	1969
Number of field books received	573	583
,, lots surveyed	894	1,077
,, surveys examined	691	541
,, lots gazetted	792	724
,, lots cancelled	71	20
,, lots amended	245	308
,, mineral-claim field books prepared	11	136
,, reference maps compiled or renewed	54	22
,, applications for purchase cleared	809	576
,, applications for pre-emption cleared	31	13
,, applications for lease cleared	7,272	7,301
,, timber sales cleared	3,154	3,047
,, Crown-grant applications cleared	942	934
,, cancellations made	2,807	600
,, inquiries cleared	1,215	1,152
,, letters received and dealt with	7,009	6,378
,, land-examination plans	3,450	2,997
,, Crown-grant and lease tracings made	8,160	6,466
,, photostats made	20,688	48,991
,, diazo prints made	409,472	429,047
,, offset prints made	1,017,309	1,469,147
,, Xerox copies made	299,400	301,096

Data Bank for Control Surveys

Control survey records are currently maintained by the Trigonometric Control Section in a card index file. During 1969 a sub-programme was added to the LSM 139 system which automatically prints the cards for the card index file after the required data have been submitted in written form and key punched, or after the data have been computed from preceding LSM 139 operations. At the present time, when requests for control survey information are received from the public or from other Government departments, a manual search of the card index is made and Xerox copies of the required cards are made for distribution. The printed cards make superior originals for copying compared with the manually written cards of the past.

It was also intended that all this data should be stored on magnetic tape to form a data bank for control surveys which could be searched for survey information in a specified area and with specified characteristics to meet the requirements

of particular survey projects. It was intended that any of the following steps could follow as a result of a search:—

(1) A printout of the survey control stations meeting the specifications with their co-ordinates, descriptive remarks, and rays to observed stations. This would make Xerox copies of the card index cards unnecessary.

(2) Cards be punched with the station co-ordinates in a form suitable for input to programme LSM 139.

(3) A plot be made of the stations to any specified scale.

Good progress has been made in the planning of this data bank and it has aroused considerable interest in other Provinces and by the Federal Government, which have similar developments in mind. However, to implement the scheme, all existing written records have to be key punched as a preliminary to getting them onto magnetic tape. Unfortunately the E.D.P. committee has had to refuse permission to proceed with this scheme at the present time due to a shortage of personnel in the key-punching section. It is hoped, however, that this is only a temporary setback and that the data bank will become a reality, perhaps in abbreviated form, in the near future. Apart from the immediate benefits of having all survey control data in the form of a data bank on magnetic tape, it is expected that useful experience will be gained which will assist in the development of banks for other types of environmental data.

FIELD WORK

Acreage Subdivision

Several blocks of town lots at Masset had to be consolidated into a 28-acre parcel by survey prior to transfer to the municipal government. Over 400 acres at Wilson Creek were surveyed to exchange for private land at Port Hardy and Port McNeill, where surveys were also necessary. Land adjoining the Alaska Highway was surveyed into district lots for eventual lease. Owing to a late start in the season, poor side-road conditions, heavy cutting, and a small party, only 2,300 acres were posted. A commercial subdivision at Nakusp of eight lots was provided at local request. In the fall of the year, much posting was done on an old subdivision near Westbank in order to locate road allowances for new construction and resubdivide the larger lots into homesite-sized lots. The work was in an area of scant survey evidence and apart from the benefit to the department will be of great assistance to local owners. Goose Spit, in Comox Harbour, was surveyed for park purposes, to be administered locally.

Waterfront Lease Lots

Loon Lake, near Grassmere	21
Lac la Hache	5
Young Lake, Cariboo	12
Powell Lake, Powell River	32
Similkameen River, near Bromley Park	23
Total	93

Rural Roadside Lots

Dragon Lake (south-east of)	8
Ta Ta Creek, Kootenay	11
Barkerville Road	17
Quesnel	38
Williams Lake	25
Quinsam River, V.I.	4
Post Creek, near Chilliwack Lake	85
Ring Creek, ski cabins, near Garibaldi	47
Total	235

Interdepartmental Surveys

Wardner cemetery-site	Public Utilities Commission.
Right-of-way at Chain Lakes	Fish and Game Branch.
Whiskey Creek Parksite	Parks Branch.
Reserve east of Tête Jaune	Parks Branch.
Barkerville Historic Park, boundary posting	Parks Branch.
Long Beach on Vancouver Island, reserve	Parks Branch.
Kennedy Lake Parksite, exchange	Lands and Parks.
Alice Lake Parksite, exchange	Lands and Parks.
Neroutsos Inlet, exchange	Lands and Parks.
Airport in Cowichan Valley, exchange	Lands and Regional District.
Right-of-way at Oliver	Water Resources.
Reservoir and right-of-way, near Oliver	Water Resources.
Forest-development road at Bone Creek	Forest Service Engineering.
Green Timbers (453.12 acres), exchange	Lands and Forest Service.

Reposting and Restoration

An old settlement known as Gold Hill in the Lardeau area of the Kootenay District was reposted to facilitate new settlement. As a number of people being displaced by the Libby Reservoir are being relocated in the Baynes Lake area, near Waldo, considerable reposting of roads and lots was done to locate previously surveyed parcels, and in the process 17 new lots were created by subdivision. In the Government Precinct area in Victoria, five more parking-lots were posted for the Department of Public Works in the spring of the year, prior to black-topping, and late in the fall a hurry-up call to repost the Courthouse property in Nelson was accommodated.

Miscellaneous Surveys

The following miscellaneous surveys were made:—

To except a road and public reserve from a sale area on the Horsefly Road, 118 acres.

A tie to complete a Hydro purchase survey on the Duncan River.

Survey to relocate an access road into Cluculz Lake, 3½ miles.

Resurvey of the North-east Quarter of Lot 3775, Cariboo Land District, to eliminate an error.

Resurvey of a road right-of-way at Lemon Creek, Kootenay Land District, known to be in error.

Survey of the boundary between Lake and Esquimalt Land Districts.

Reserve for public on Kalamalka Lake, 1.6 acres.

Inspection Surveys

A complaint concerning a subdivision at Blue River, received through the Inspector of Legal Offices, was investigated by survey and found to be groundless. A similar case at Burnaby was also investigated and no fault found. Three inspections of water boundaries on new surveys were made and adjustment made in two of them. A survey of a boundary in Cowichan Lake Land District, which was the subject of disagreement between owners and had originally been established by survey confirmed by this department, was investigated and found to be in error and steps were taken to correct the records. A meticulous survey of a water boundary and upland parcels at Twin Bays on Kootenay Lake was required for a pending Court action, and this entailed the preparation of numerous plans and annotated photographs.

Highway Surveys

Owing to lack of sufficient surveyors to handle the work, only two parties were fielded on the survey of highways. Twenty miles was surveyed in the Blue River area and 15.2 miles was finished in the area easterly of Tête Jaune. The surveyor in charge of the Tête Jaune section suffered a heart attack at the height of the survey work, which curtailed the eventual production of distance. However, the crew carried on admirably and extra supervision was arranged.

Resignations

The Division regrets the loss of services of Mr. G. T. Mullin, B.C.L.S., and his field assistant, Mr. T. Dignan, who both had been with the service for many years and did yeoman work in all the difficult areas. They resigned to go into private practice.

TOPOGRAPHIC DIVISION

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

The era of rapid transportation and electronic instrumentation has definitely affected a surveyor's way of life. Where, in the past, he was usually assigned one area per season, he now can be faced with many assignments that often are widely scattered around the Province. This past season our integrated survey crew completed nine separate tasks. The control surveys completed eight and the mapping party, assisted by a helicopter under contract, completed three, the one exception being the Triangulation Section, which was assigned to a British Columbia-Yukon-Northwest Territories Boundary Commission project for the season.

K. M. Bridge, B.C.L.S., was in charge of the National Topographic Series mapping party which completed control for 16 map-sheets in 104 H area and obtained additional vertical control to revise the easterly four sheets of 104 G area. (*See* Fig. 1.) This work is located to the east of the Stewart–Cassiar Highway, and in the vicinity of Kinaskan and Cold Fish Lakes, which are south of the Stikine River and south-east of Telegraph Creek. To assist them they had a Bell G3B1 helicopter chartered on a 4-month/400-hour basis from Tranwest Helicopters (1965) Ltd. of Vancouver and the Department's De Havilland Otter aircraft. The Otter also assisted the British Columbia-Yukon Boundary crew when it moved to and from the Liard River crossing. This mountainous section of British Columbia lies on the route usually taken by the weather systems generated in the Gulf of Alaska. During the summer there were 32 days in which the work was rained out and on many of the others it was marginal, necessitating an early return to camp.

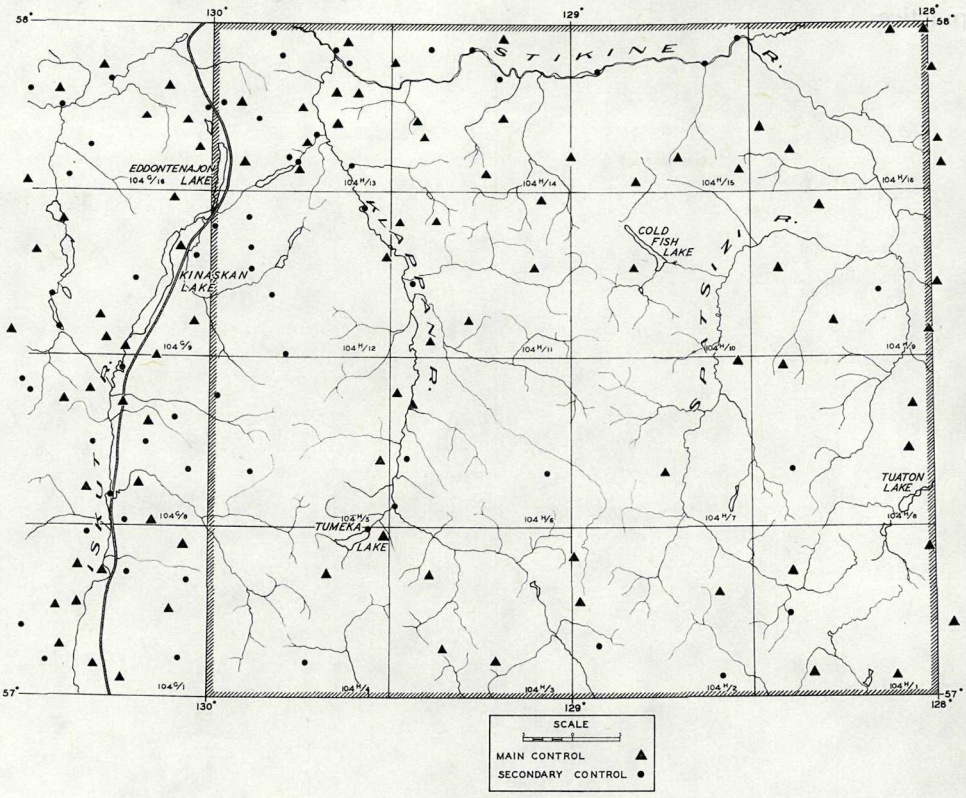


Fig. 1.

K. M. Bridge and his crew commenced their season's operation at Watson Lake on an extension of the pondage study of the Liard and Dease Rivers which was done in 1962. The extension was to the 2,200-foot contour, but horizontal control for the river valleys could only be obtained on the adjacent open hills, so that a perimeter traverse by tellurometer was run covering an area 120 miles by 80 miles. The actual length of the traverse was 280 miles and comprised 11 stations from which photo-control points in the mapping area were fixed. One hundred and twenty hours of flying time for the helicopter were used, 80 for horizontal control and 40 for vertical. This and a second area at Atlin were requested by the Water Resources Service for study purposes.

The Atlin assignment stretched from the mouth of the Taku River at the Alaska-British Columbia border to the north end of Atlin Lake. Part of it had been included in the mapping done in 1952 by D. J. Roy, B.C.L.S., and in 1953 by A. F. Swannell, B.C.L.S. Forty-two tellurometer traverse stations were occupied, while 18 of the old stations used had only to be targeted for control identification. Vertical control was derived from ground photos and vertical angles. While at Atlin, the survey crew and helicopter were commandeered by the Forest Service to fight a forest fire, which accounted for three working-days. A total of 29 days was spent at Atlin, during which 80 hours of helicopter time was used.

The helicopter logged a combined total of 388 hours on its contract. The Otter aircraft flew 271 hours for the mapping crews, consisting of moving and supplying base camps, transportation of crews to and from pickup points for the helicopter, and low-level photo and station identification flights. Following its return to Victoria, it was used by the Land Inspectors of the Lands Service and also by the Highways Department.

Integrated Survey Area No. 3 was declared in June, situate in the Kootenay Land District, comprising a portion of the City of Nelson.

A. M. Barber, B.C.L.S., and his integrated survey crew completed nine separate assignments. The first, a co-ordinate control system for the City of Victoria was used as a training scheme which commenced in April and was completed in May, fixing 42 stations by interconnected traverses routed through the redevelopment areas. They used a geodimeter and oriented the scheme by tellurometer ties to the geodetic stations on Mount Tolmie, Gonzales Hill, and the Douglas Building.

The District of North Cowichan was the largest project and consisted of fixing the location and elevation of 230 monuments set by the municipal crews of North Cowichan and Duncan. While the ideal situation for interconnected urban control traverses is a flat area of rectangular city blocks in the Cowichan area road access is generally sparse, winding, and tree-lined. This difficult condition made necessary the use of over one hundred additional temporary traverse hubs to interconnect the monuments and forced the use of undesirably large traverse loops in some cases. The following two precautions were introduced that are not normally used in this type of work—bearing control was positioned throughout the work so that a bearing check could be made at intervals of about 20 angles; and on the larger loops, levels were double run as a precaution against compensatory errors. This project was completed by the end of July and the crew moved to Kelowna, where, in 1966, we had fixed 37 control monuments. This year the city increased the density of its monumentation to meet the integrated survey specifications. This generally meant the setting of a new monument between each pair of existing monuments, and with other separate additions brought the new total of monuments set to 112. The new spacing necessitated the occupation by the survey crews of both new and existing monuments. In effect it was necessary to resurvey the 1966 work (except for

trigonometric ties), despite the fact that the earlier work was of good quality. The work was completed in one month and included a chainage base on the retaining wall of the lake at the Yacht Club.

Filling in where convenient, there were two two-day measurings by geodimeter commitments for the Department of Highways at Vancouver and Mission and two building-site plans for the Public Works Department at Essondale.

The university students hired for this work returned to their studies at the end of August, and the remainder of the crew completed two reconnaissance and layout design plans for the Cities of Prince George and Penticton for integrated survey programmes.

The control crew, with G. New, B.C.L.S., in charge, completed eight separate projects, the first, in March in the Chilliwack River valley for the Forest Service, was a topographic plan of their Chipmunk Run Nursery, drawn at the scale of 100 feet to the inch, with 2-foot contours. The last in December was for the Public Works Department at Creston, for a topographic plan of parts of two lots to be used as a building-site for administration buildings of the Parks Branch Bird Sanctuary.

Between the first and last projects, surveys were made on a second nursery-site at Campbell River; a building-site for the Department of Public Works at Poirer Lake; a large mapping project in the vicinity of Highland Valley for the Department of Mines and Petroleum Resources that covered an area of 1,200 square miles, lying between Mount Zakwaski and Nicola in the south and Cache Creek and Savona to the north, mapped at 1,000 feet to 1 inch and to be used as a base to plot geologic data; a control survey for mapping of the valley between Alta and Green Lakes; a culture and map check of the Squamish District; and a request from the Water Resources Service for elevations along the Shuswap River, between Sugar and Mara Lakes, to record high and low water elevations, the survey crew travelling to Enderby late in May to mark high water, and targets were set for identification prior to photography. Upon completion of the Highland Valley project, they returned to Armstrong to establish elevations for the points established earlier. To obtain these, 24 bench marks were set, and 90 miles of double-run levels were required, as well as 30 miles of single run to tie in the high and low water marks and picture points. While these levels were being carried out, Mr. New and one man travelled to Williams Lake to meet a helicopter for use in the Nazko River area. Several years ago, horizontal control for mapping had been obtained over eight map-sheets in 93 B map area, but due to circumstances the vertical control had to be postponed. In a period of four days and 27 flying hours this was obtained.

The control crew completed 136 working-days in the field and logged over 10,000 miles on each vehicle.

Twenty-three half-sheets for the National Topographic Series, totalling approximately 2,733 square miles, were compiled in the Photogrammetric Section, in addition, eight more were prepared for early 1970. Bridging was completed in four full map-sheets, 93 M/13, 14, 15, 16 in the Babine area.

There were 21 large scale projects ranging in scale from 40 to 1,320 feet to 1 inch, totalling approximately 666 square miles. The projects consist of ten for the Water Resources Service, five for the Department of Highways, one for the Department of Mines and Petroleum Resources, two for the Forest Service, one for the Department of Public Works, one for the Lands Service, and one for the Olympic Development Association. In addition, three more were bridged and are presently being compiled—Highland Valley for the Department of Mines, Hope to Merritt for the Department of Highways, and the townsite of McBride for the Fort George Regional Planning Board.

The Division is continuing the study of the use of ortho-photo mapping. Several of our senior officers attended a conference on the subject and discussed the latest equipment and machines with representatives of various companies. We were provided with prints for our appraisal and one company has offered use of its equipment. At the present it appears that the prime use for such maps would be for forest-inventory use.

The Draughting Section reports the compilation of 31 standard topographic manuscripts at the scale of 2 inches to 1 mile.

One hundred and sixty-two large-scale mapping plans at various scales were completed, as well as the plotting of the cadastral surveys on 47 Federal Government 1:50,000-scale manuscripts.

Worthy of mention are the Libby Pondage project that is made up of 63 sheets at the scale of 200 feet to the inch, covering the Kootenay River from Bull River to the International Boundary, as well as the Squamish Valley project of 17 sheets at the same scale. The Gulf Islands were drawn at the scale of 1,320 feet to 1 inch, containing 12 sheets, which can be combined and reduced to produce single prints of a very popular boating area.

One integrated survey plan was completed covering the City of Nelson, Integrated Survey Area No. 3, as well as a revision of the Integrated Survey Area No. 1 in the Municipality of Surrey.

The Federal Government now has 142 of our 1:50,000-scale manuscripts on hand for printing, which are in various stages of reproduction.

Copies of the photogrammetric large-scale mapping listed 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	Date
S.P. 1	Goldfields	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. 7	Mount Farrow	1″=13 ch.	500′	1	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

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

LARGE-SCALE MAPPING—*Continued*

No.	Name	Scale	Contour Interval	No. of Sheets	Date
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
M40	Chilliwack River	1″= 600′	20′	7	1956
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′–2,600′, then 50′	98	1958–59 1961–63
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
M 68	Hansard Lake	1″=1,320′	20′	3	1958
M70	Courtenay-Comox	1″=1,320′	25′–600′, then 500′–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
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

LARGE-SCALE MAPPING—*Continued*

No.	Name	Scale	Contour Interval	No. of Sheets	Date
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 By-pass(2)	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 (Findlay River)	1″=1,320′	25′–2,500′, then 50′	31	1965
M170	Gibson Pass	1″=1,000′	25′–50′	3	1965–66
M171	Black Tusk Meadows	1″= 200′	5′	2	1965
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	Nemotode	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(2)	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.	11	1967
M218	Hells Gate	1″= 50′	5′	1	1967
M218	Hells Gate	1″= 200′	50′	1	1967
M220	Floods-Hope(2)	1″= 100′	5′	9	1968
M222	Sayward-Beaver Cove(2)	1″= 400′	20′	24	1968
M226	Salmon River	1″= 500′	10′	9	1968
M228	Portage Inlet	1″= 16′	2′	2	1967
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 Lake	1″= 200′	2′	1	1968
M238	Mission Creek	1″= 500′	20′	1	1968
M238	Mission Creek	1″= 200′	10′	1	1968
M242	Unuk River*	1″=1,320′	100′	----	------
M243	Sugar Lake Outlet	1″= 400′	10′	2	1968
M245	Saanich Peninsula*	1″= 400′	10′	----	------
M249	Libby Pondage	1″= 200′	5′	63	1969

* Compilation in process.
2 Restricted.

LARGE-SCALE MAPPING—*Continued*

No.	Name	Scale	Contour Interval	No. of Sheets	Date
M250	The Woodlands School	1″= 40′	2′	4	1969
M249A	Wardner	1″= 100′	2′	2	1969
M256	Flood Hope Addition(2)	1″= 100′	5′	2	1969
M256A	Flood Hope Addition(2)	1″= 100′	5′	3	1969
M259	Cowichan Valley Forest Museum*	1″= 100′	5′	1	1969
M260	Highland Valley*	1″=1,320′	50′	----	-------
M261	Windermere Lake*	1″= 200′	10′	----	-------
M262	McBride*	1″= 200′	10′	----	-------
M263	Alta Lake*	1″= 500′	------	----	-------
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′	----	-------

* Compilation in process.
2 Restricted.

BRITISH COLUMBIA TOPOGRAPHIC MAP SHEETS SHOWING DATES OF FIELD SURVEYS

Sheet	Date
82 F/3	1951, 1960
82 F/4	1944, 1947
82 K/11 W.	1952
82 K/12	1952
82 L/7	1958
82 L/10	1958
82 M/13	1959
83 D/4	1959
83 D/5	1959
83 D/12	1959, 1960
83 D/13 W.	1960
92 B/5	1937, 1938, 1955
92 B/5 W.*	1963
92 B/6 W.	1955
92 B/11 W.	1955
92 B/12*	1963
92 B/13*	1963
92 B/14*	1951
92 C/8*	1937, 1938, 1963
92 C/9*	1937, 1938, 1963
92 C/10*	1937, 1938, 1965
92 C/11 E.*	1938, 1965
92 C/13 E.	1938
92 C/14	1938
92 C/14 E., part*	1965
92 C/15*	1965
92 C/16*	1963, 1965
92 E/1 E.	1942
92 E/7 E.	1946
92 E/8	1943, 1946
92 E/9	1938, 1940, 1947
92 E/10	1947
92 E/14	1948
92 E/16	1947
92 F/1*	1965
92 F/2*	1938, 1940, 1942
92 F/2, part*	1965
92 F/3	1938, 1940, 1941
92 F/4	1942
92 F/5	1937, 1938, 1943
92 F/6	1938, 1940–43
92 F/7*	1940–43
92 F/7, part*	1965
92 F/8	1942, 1943, 1950
92 F/8 part*	1965
92 F9	1950
92 F/10	1950, 1953
92 F/11	1934, 1935
92 F/12	1936–38
92 F/13	1935, 1936
92 F/14	1935
92 F/15 E., part	1950
92 F/16 E., part	1950
92 G/4*	1963, 1965
92 G/5	1950, 1952
92 G/7, part	1940
92 G/10, part	1940
92 G/11	1952
92 G/12	1950, 1952
92 G/13	1950, 1952
92 G/14	1952
92 H/1	1920, 1923, 1950
92 H/2	1923, 1949
92 H/3	1924, 1931, 1948, 1949
92 H/4	1948, 1956
92 I/12	1958
92 I/13	1958
92 J/15	1948, 1949
92 J/16	1948, 1949
92 K/1 E., part	1950
92 K/2 W.*	1961
92 K/3	1949
92 K/4	1949
92 K/5	1949
92 K/6	1949
92 K7*	1961
92 L/1	1932
92 L/2	1931, 1932
92 L/3	1948
92 L/4	1948
92 L/6	1931, 1934, 1940
92 L/7	1931
92 L/8	1931, 1932
92 L/10	1931, 1940, 1956
92 L/11	1940
92 L/12	1935, 1936
92 L/13	1936
92 M/3	1959
92 M/4	1959
92 M/5	1959
92 N/1	1958
92 N/7	1958
92 N/8	1958
92 N/9	1958
92 N/10	1958
92 N/15	1958
92 O/1	1950
92 O/2	1947
92 O/3	1958

* Compilation in process.
† Field survey completed.

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

Sheet	Date
92 O/4	1958
92 O/5	1958
92 O/6	1958
92 O/7	1950, 1958
92 O/8	1950
92 O/9	1951
92 O/10	1958
92 O/11	1958
92 O/12	1958
92 O/16	1951
92 P/2	1959
92 P/3	1959
92 P/4	1958
92 P/5	1958
92 P/6	1959
92 P/7	1959
92 P/10	1959
92 P/11	1959
92 P/12	1958
92 P/13	1958
92 P/14	1959
92 P/15	1959
92 P/16	1959
93 A/1*	1959
93 A/2*	1936, 1959, 1960
93 A/3	1959, 1960
93 A/4	1959
93 A/5	1935
93 A/6	1935
93 A/7*	1936, 1959, 1960
93 A/8*	1959
93 A/9*	1959, 1960
93 A/10*	1934, 1960
93 A/11	1933, 1934
93 A/12	1931, 1933, 1934
93 A/13	1934
93 A/14	1933, 1934
93 A/15*	1934, 1960
93 A/16*	1960
93 B/1	1951
93 B/6*	1963
93 B/7*	1963
93 B/8	1952
93 B/9	1950
93 B/9 W.*	1965
93 B/10*	1963
93 B/11*	1963
93 B/12*	1963
93 B/13*	1963
93 B/14*	1963
93 B/15*	1963
93 B/16	1950
93 B/16 W.*	1965
93 C/5	1959
93 D/7 E.	1958
93 D/8	1958, 1959
93 G/2	1933, 1960
93 G/3	1960
93 G/4	1960
93 G/5	1960
93 G/6	1960
93 G/7	1933, 1960
93 G/10	1960
93 G/11	1960
93 G/12	1960
93 G/14	1948
93 I/8	1956
93 I/9	1956
93 I/10	1956
93 I/11	1957
93 I/12	1957
93 I/13	1957
93 I/14	1957
93 I/15	1956
93 I/16	1956
93 J/2	1949
93 J/3	1949
93 J/5	1961
93 J/6	1961
93 J/11	1961
93 J/12	1961
93 J/13	1961
93 K/1	1946
93 K/2	1946
93 K/7	1960
93 K/8	1960
93 K/9	1960
93 K/10	1960
93 K/11	1961
93 K/12	1961
93 K/13	1961
93 K/14	1961
93 K/15	1961
93 K/16	1961
93 L/2	1951
93 L/7	1951
93 L/8	1951
93 L/9	1951
93 L/10	1950, 1951
93 L/11	1950
93 L/14	1950
93 L/15	1962
93 L/16	1962
93 M/1	1962
93 M/2	1963
93 M/5	1949
93 M/7	1963
93 M/8	1963
93 M/9	1963
93 M/10	1963
93 M/11	1963
93 M/12	1949
93 M/13*	1963
93 M/14*	1963
93 M/15*	1963
93 M/16*	1963
93 N/1*	1962
93 N/2*	1962
93 N/3*	1962
93 N/4*	1962
93 N/5*	1962
93 N/6*	1962
93 N/7*	1962
93 N/8*	1962
93 N/9*	1962
93 N/10*	1962
93 N/11*	1962
93 N/12*	1962
93 O/1	1957
93 O/4*	1961
93 O/5*	1961
93 O/6	1957
93 O/8	1957
93 O/11	1957
93 O/12	1957
93 O/13	1957
93 O/14	1957
93 P/1	1956
93 P/2	1956
93 P/3	1957
93 P/4	1957
93 P/5	1957
93 P/6	1957
93 P/7	1956
93 P/8	1956
94 B/4	1939, 1957

* Compilation In Process.
† Field survey completed.

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

Sheet	Date
94 C, part	1939
94 D/1*	1963
94 D/2*	1963
94 D/3*	1963
94 D/4*	1963
94 D/5*	1963
94 D/6*	1963
94 D/7*	1963
94 D/8*	1963
94 E, part	1939
94 F, part	1939
94 L, part	1940, 1941
94 M, part	1941
102 I/8 E.	1935, 1937
102 I/9	1935–37
102 I/15	1937
102 I/16	1936, 1937
102 P/8 E.	1961
102 P/9 E.	1961
102 P/16	1961
103 A/1	1961
103 A/2 E.	1961
103 A/8	1961
103 A/9	1961
103 A/13 E.	1961
103 G/1 E.	1961
103 G/7 E.	1961
103 G/8	1961
103 G/9	1961
103 G/10 E.	1961
103 G/15 E.	1961
103 G/16	1961
103 H/3	1961
103 H/4	1961
103 H/5	1961
103 H/6	1961
103 I/2	1949
103 I/7	1948
103 I/10	1947
103 P/9	1949
103 P/10 E.	1950
103 P/14 E.	1950
103 P/15	1950
103 P/16*	1967
104 A/1*	1967
104 A/2 E.*	1967
104 A/2 W.	1950
104 A/3	1950
104 A/4*	1967
104 A/5 E.	1950
104 A/5 W.*	1967
104 A/6	1950
104 A/7*	1967
104 A/8*	1967
104 A/10*	1967
104 A/11 E.*	1967
104 A/11 W.	1951
104 A/12	1951
104 A/13 E.*	1967
104 A/13 W.	1951
104 A/14*	1967
104 A/15*	1967
104 B/1*	1967
104 B/6*	1967
104 B/7*	1967
104 B/8*	1967
104 B/9*	1967
104 B/10*	1967
104 B/11*	1967
104 B/12 E.*	1967
104 B/12 W.*	1966
104 B/13 E.*	1965
104 B/13 W.*	1966
104 B/14*	1965
104 B/15*	1965
104 B/16	1951
104 G/1	1951
104 G/2*	1965
104 G/3*	1965
104 G/4 E.*	1965
104 G/4 W.*	1966
104 G/5 E.*	1965
104 G/5W.*	1966
104 G/6*	1965
104 G/7*	1965
104 G/8	1951
104 G/9	1951
104 G/10*	1966
104 G/11*	1966
104 G/12*	1966
104 G/13	1966
104 G/14	1951
104 G/15	1951
104 G/16	1951
104 H/1†	1969
104 H/2†	1969
104 H/3†	1969
104 H/4†	1969
104 H/5†	1969
104 H/6†	1969
104 H/7†	1969
104 H/8†	1969
104 H/9†	1969
104 H/10†	1969
104 H/11†	1969
104 H/12 E.†	1969
104 H/12 W.†	1951, 1969
104 H/13 E.†	1969
104 H/13 W.†	1951, 1969
104 H/14†	1969
104 H/15†	1969
104 H/16†	1969
104 J/2 W.	1952
104 J/3	1952
104 J/4	1952
104 J/5	1952
104 J/12	1952
104 J/13	1952
104 K/16 E.	1952, 1953
104 N/1	1952, 1953
104 N/2	1953
104 N/3 E.	1953
104 N/5	1952
104 N/6	1952, 1953
104 N/7 W.	1953
104 N/7 E., part	1953
104 N/11 W.	1952
104 N/12	1952
104 N/13	1952
104 P, part	1941
104 P/15	1941

* Compilation In Process.
† Field Survey Completed.

Bugaboo Glacier and Snowpatch Spire, Purcell Mountains, located within Bugaboo Alpine Recreation Area.

GEOGRAPHIC DIVISION

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

The Geographic Division distributed a record number of maps during 1969, the cumulative 12-month total of 149,421 being an increase of 16.5 per cent over 1968. Although the number of maps edited and reproduced was slightly lower than the previous year, seven were completely new compilations, compared with only two in 1968. Except for a very small part of National Topographic Block 82 in South-eastern British Columbia, which will be covered on a forthcoming map, full land status coverage is now available south of 55° N. latitude. Including the Manson River sheet (93 N) which was added in 1969, three maps are also available for the belt between the 55th and 56th parallels and work is under way on two other status sheets north of 55° N. latitude in North-eastern British Columbia. In the decade since 1960, 30 new sheets at 1:250,000 or 1 inch to 2 miles scale have been added to the inventory of Provincial land status maps and another 32 sheets revised or recompiled.

The rate of staff turn-over was comparable to that of most recent years. Two appointments were made to fill vacancies arising out of the retirement of one clerk and resignation of a draughtsman.

As listed in Table H, four of the new or completely revised status maps, namely Fort Fraser (93 K) and Smithers (93 L) at 1:250,000 scale and Tulameen (92 H/NE) and Princeton (92 H/SE) at 1 inch to 2 miles were third status editions of these areas, which is a good indication of the popularity of Provincial status maps for use by the general public and Government departments. The continuing strong interest in this series is reflected by the reprinting of another four sheets, Upper Kettle River (82 E/NE), Kelowna (82 E/NW), Cranbrook (82 G/NW-NE), and Merritt (92 I/SE), without revision to replace stocks depleted by demand.

At the end of the year, 17 maps were in various stages of preparation (*see* Table J). Of this total, ten will be printed at 1 inch to 2 miles scale and three at 1:250,000 scale, all with status information. Other forthcoming maps include a reprinting of sheet 1 J (British Columbia) and 1 D (North-eastern British Columbia) and new maps 3 R (Fort Nelson, land status) and P.S.G.-3 (Western Garibaldi Park). Completion of Mount Assiniboine (82 J/NW) will completely fill in the 1 inch to 2 miles series south of the 51st parallel and east of the 122nd meridian. The Pitt River, Squamish, Bridge River, and Pemberton maps will replace current coverage at 1:250,000 scale for areas where land development is increasing in intensity and status is becoming more difficult to show at the smaller scale.

Late in 1968, Federal mapping agencies instituted a new policy of producing 1:50,000 National Topographic maps as single sheets rather than east halves and west halves. Table I of this Division's report and Index 14 in the Index to Published Maps in the envelope attached to the back cover of this Lands Service Annual Report show all new 1:50,000 map-sheets in the joined format. Stocks of 16 full sheets and 42 half sheets, published by the Department of Energy, Mines, and Resources, Ottawa, were received, including two Provincial sheets, Canim Lake (92 P/15) and Mahood Lake (92 P/16) and another eight were awaited at the end of the year. By the end of 1969, lithographed maps at 1:50,000 scale covered about one-half of the Province compared with only one-third 10 years earlier.

Table K shows that another 59 Provincial topographic manuscripts were awaiting publication in Ottawa at the end of the year. These will fill in several gaps on Index 14.

A total of 66 map-sheets was checked for place names and 233 new gazetteer cards were filed.

An average of nearly 39 letters was received and acted upon each working-day of the year. Besides the rising inflow of correspondence, direct sales of maps through the map distribution office also continued to grow steadily.

Two field parties completed culture checks for sheets 92 G/NW, 92 G/NE, and 92 J/SW on the Lower Mainland and 82 F/SW, 82 E/NE, and 82 E/NW in the Southern Interior. All of these map-sheets were in various stages of production by the end of 1969.

Among the special jobs carried out for other Departments and the public (*see* Table F) were a revised edition of the British Columbia Air Facilities Chart for the British Columbia Aviation Council; a special map of Northern Vancouver Island showing transportation routes, for the Minister of Municipal Affairs; preparation of maps for the " Survey '69 " air tour through British Columbia, for the Minister of Lands, Forests, and Water Resources; checking, rewriting, and preparing maps of polling divisions for the 1969 Provincial Election for the Chief Electoral Officer; complete revision of Industrial Map of Metropolitan Area and Lower Mainland of British Columbia for Department of Industrial Development, Trade, and Commerce; preparing legal descriptions by metes and bounds of four changes to eight school districts for the Department of Education, and the Land Recording Districts of Fort Nelson and Fort St. John for the Lands Branch; inscribing 85 certificates for presentation to civil servants of 25 years' service and preparing place cards for two luncheons.

The Trigonometric Control Section made least-square adjustments for seven localities, using the " Cosmos " computer programme and three localities under the " Bride " programme. The number of triangles or traverse stations involved in all 10 projects totalled 1,240. A tabular summary of this work is given in Tables A, B, and C.

For the first time, all 11 land series bulletins were reprinted during a single year. Minor revisions were done on Bulletins 1, 2, 3, 5, 7, 8, 9, 10, and 11, while Bulletin No. 4 (Vancouver Island) was reprinted without revision. A completely revised text of Bulletin Area No. 6 (Kamloops) was sent to the Queen's Printer. At the end of 1969, the text of a revised second edition of Bulletin Area No. 1 (Kootenay) was also in hand. The research officer made a field trip to the Prince Rupert-Smithers Bulletin Area to gather information for a revised second edition of Bulletin No. 8. New sub-area maps and fold-out maps were completed for all bulletins and these will appear in future reprintings.

Other research work included preparation of a text and maps for the " Survey '69 " aerial tour from Castlegar to Whitehorse, and lectures at the Department of Travel Industry Tourist Counsellors' course in Vancouver.

Complete Indexes to Published Maps, Indexes 8 to 14, may be found in the manila envelope attached to the back cover of this Annual Report.

STATISTICAL COMPUTATIONS

Table A.—Least-square Adjustments by " Cosmos " Completed

Net	Locality	Type of Bearings	Number of Triangles or Traverse Stations Involved
Provincial	Libby Dam Pondage	True	40
Provincial	Tweedsmuir Park area	True	150
Provincial	Gardner Canal	True	103
Provincial	Highland Valley	True	35
Provincial	Atlin and Watson Lakes areas	True	40
Provincial	Cold Fish Lake area	True	86
Canadian Hydrographic Service	Gardner Canal	True	107

Table B.—Least-square Adjustments by " Bride " Completed

Net	Locality	Type of Bearings	Number of Triangles or Traverse Stations Involved
Provincial	North Vancouver	Grid	248
Provincial	Kelowna	Grid	132
Provincial	North Cowichan	Grid	299

Table C.—Records

	1964	1965	1966	1967	1968	1969
Index cards—						
New	1,475	1,693	673	1,184	883	3,088
Old (rewritten)	293	1,453	2,482	912	2,102	1,375
Total on file	35,547	37,240	37,913	39,097	39,980	43,068
Requests for control attended to	389	334	368	361	412	495

Well-site surveys checked during 1969, 166.

Table D.—Canadian Permanent Committee on Geographical Names

	1964	1965	1966	1967	1968	1969
Number of map-sheets or charts checked	22	93	85	48	49	66
Number of names checked	6,090	5,584	11,428	13,018	4,754	6,835
Number of new names recorded	277	402	440	314	260	233

Table E.—Map Stock and Distribution

	1964	1965	1966	1967	1968	1969
Number of requisitions filled	10,395	9,429	9,550	11,639	12,174	12,311
Maps issued to department and public	88,322	86,755	95,540	114,723	128,303	149,421
Maps received into stock	71,178	107,741	155,133	261,314	221,187	178,386
Total value of maps issued	$58,469	$56,152	$62,977	$73,550.82	$77,086.36	$91,633.29

Table F.—Geographic Work for Other Departments and Public

	1964	1965	1966	1967	1968	1969
Total number of items	19	20	23	22	28	23
Total value of work	$5,213	$4,460	$4,307	$2,927.13	$1,612.36	$5,113.65

Table G.—Letters

	1964	1965	1966	1967	1968	1969
Letters received and attended to	8,469	7,297	8,007	9,481	9,044	9,729

Table H.—Maps Prepared and Reproduced by the Geographic Division, Victoria, during 1969

Map No.	Name	Scale	Remarks
	New Editions		
1F	West Central British Columbia (planimetric)	1 in. to 10 mi.	Reprint, complete revision.
1FL	West Central British Columbia (landforms)	1 in. to 10 mi.	Reprint, complete revision.
3E	Peace River	1 in. to 4 mi.	Land status revision only.
92 L/102I	Alert Bay (first status edition)	1:250,000	New, seven colours, contoured.
92 N	Mount Waddington (first status edition)	1:250,000	New, seven colours, contoured.
93 F	Nechako River (second status edition)	1:250,000	Reprint, complete revision.
93 K	Fort Fraser (third status edition)	1:250,000	New, seven colours, contoured.
93 L	Smithers (third status edition)	1:250,000	Reprint, complete revision.
93 N	Manson River (first status edition)	1:250,000	New, seven colours, contoured.
103 H	Douglas Channel (second status edition)	1:250,000	New, seven colours, contoured.
92 H/NE	Tulameen (third status edition)	1 in. to 2 mi.	New, seven colours, contoured.
92 H/SE	Princeton (third status edition)	1 in. to 2 mi.	New, seven colours, contoured.
	Reprints		
1FLS	West Central British Columbia (special)	1 in. to 10 mi.	Reprint, no revision.
82 E/NE	Upper Kettle River (first status edition)	1 in. to 2 mi.	Reprint, no revision.
82 E/NW	Kelowna (second status edition)	1 in. to 2 mi.	Reprint, no revision.
82 G/NW-NE	Cranbrook (first status edition)	1 in. to 2 mi.	Reprint, no revision.
92 I/SE	Merritt (second status edition)	1 in. to 2 mi.	Reprint, no revision.

Table I.—Provincial Government Topographic Manuscripts Prepared and Reproduced at 1:50,000 Scale by the Canadian Government, Ottawa, during 1969

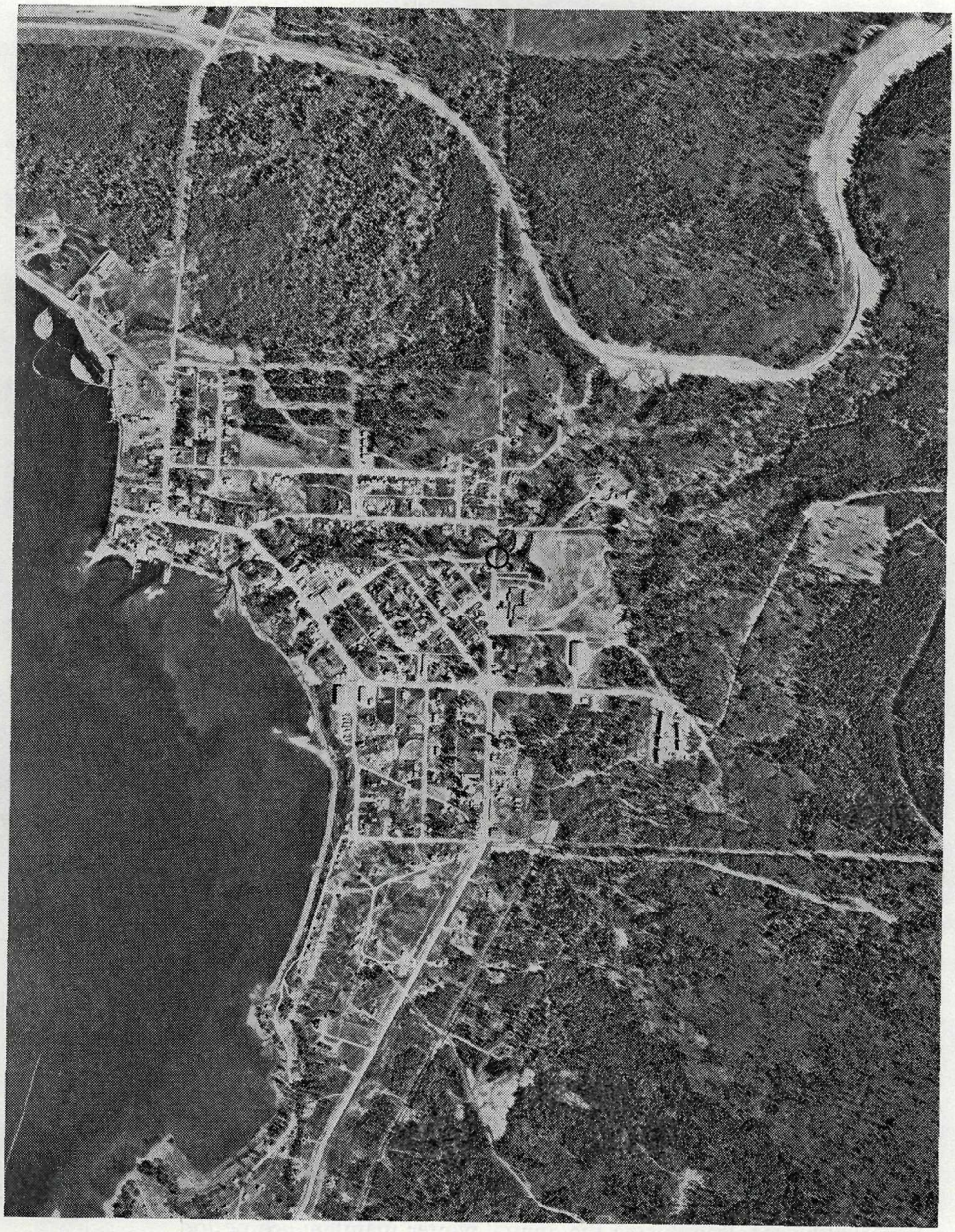
Map No.	Name	Map No.	Name
92 P/15	Canim Lake (first edition).	92 P/16	Mahood Lake (first edition).

Table J.—Maps Being Prepared by the Geographic Division, Victoria, during 1969

Map No.	Name	Scale	Remarks
1J	British Columbia, post offices, roads, etc.	1 in. to 30 mi.	In lithography.
1D	North Eastern British Columbia	1 in. to 10 mi.	In compilation.
92 K/92 J (W)	Bute Inlet (third status edition)	1:250,000	In compilation.
93 D/103A	Bella Coola (third status edition)	1:250,000	In compilation.
93 P	Dawson Creek (first status edition)	1:250,000	In draughting.
82 E/N.E.	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 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 draughting.
92 G/NE	Pitt River (first status edition)	1 in. to 2 mi.	In draughting.
92 G/NW	Squamish (first status edition)	1 in. to 2 mi.	In draughting.
92 I/SE	Merritt (third status edition)	1 in. to 2 mi.	In compilation.
92 J/NE	Bridge River (first status edition)	1 in. to 2 mi.	In draughting.
92 J/SE	Pemberton (first status edition)	1 in. to 2 mi.	In compilation.
3R	Fort Nelson (land status edition)	1 in. to 1 mi.	In draughting.
P.S.G. 3	Western Garibaldi Park	1 in. to 1 mi.	In draughting.

Table K.—Provincial Government Topographic Manuscripts Being Prepared at 1:50,000 Scale by the Canadian Government, Ottawa, during 1969

Map No.	Name	Map No.	Name
83 D/4	Murtle Lake (first edition).	93 K/11	Cunningham Lake (first edition).
83 D/5	Angus Horne Lake (first edition).	93 K/12	Pendleton Bay (first edition).
83 D/12	Azure River (first edition).	93 K/13	Tochcha Lake (first edition).
83 D/13W	Kiwa Creek (first edition).	93 K/14	Trembleur Lake (first edition).
92 O/3	Warner Pass (first edition).	93 K/15	Inzana Lake (first edition).
92 O/4	Tchaikazan River (first edition).	93 K/16	Tezzeron Creek (first edition).
92 O/5	Mount Tatlow (first edition).	93 L/15	Driftwood Creek (first edition).
92 O/6	Nadila Creek (first edition).	93 L/16	Fulton Lake (first edition).
92 O/7	Churn Creek (first edition).	93 M/1	Old Fort Mountain (first edition).
92 O/10	Gaspard Creek (first edition).	93 M/2	Harold Price Creek (first edition).
92 O/11	Big Creek (first edition).	93 M/7	Netalzul Mountain (first edition).
92 O/12	Elkin Creek (first edition).	93 M/8	Nakinilerak Lake (first edition).
92 P/2	Criss Creek (first edition).	93 M/9	Bulkley House (first edition).
92 P/3	Loon Lake (first edition).	93 M/10	Nilkitkwa River (first edition).
92 P/6	Green Lake (first edition).	93 M/11	Gunanoot Lake (first edition).
92 P/7	Bridge Lake (first edition).	102 P/9E-8E	Calvert Island (first edition).
92 P/10	Deka Lake (first edition).	102 P/16	Hunter Island (first edition).
92 P/11	100 Mile House (first edition).	103 A/1-2E	Bella Bella (first edition).
92 P/14	Lac la Hache (first edition).	103 A/8	Spiller Channel (first edition).
93 A/3	Murphy Lake (first edition).	103 A/9	Roderick Island (first edition).
93 A/4	150 Mile House (first edition).	103 G/8-1E	Banks Island (first edition).
93 J/5	Great Beaver Lake (first edition).	103 G/9	McCauley Island (first edition).
93 J/6	Youngs Creek (first edition).	103 G/10E-7E	Griffith Harbour (first edition).
93 J/11	Weedon Lake (first edition).	103 G/15E	Kitkatla Inlet (first edition).
93 J/12	Carrier Lake (first edition).	103 G/16	Oona River (first edition).
93 J/13	Salmon Lake (first edition).	103 H/3	Gil Island (first edition).
93 K/7	Shass Mountain (first edition).	103 H/4-A/13E	Trutch Island (first edition).
93 K/8	Fort St. James (first edition).	103 H/5	Port Stephens (first edition).
93 K/9	Pinchi Lake (first edition).	103 H/6	Hartley Bay (first edition).
93 K/10	Stuart Lake (first edition).		



Village of Fort St. James, May, 1969. Pacific Great Eastern Railway right-of-way at top of photo.

AIR DIVISION

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

The acquisition of air photographs reached a new high of 40,000 prints despite a season of unusual weather; a highlight of air operations this year was the lease for two months of a Lear Jet for air photography.

During the year a 40-per-cent increased demand for air photos developed, and over one-quarter million prints were produced. In map compilation, our arrangements with the Forest Inventory Division were redefined so that we will now produce finished planimetric sheets giving the original to them and retaining a 20-chain master and a 40-chain reduction from which we can quickly produce the very useful 40-chain series. Our output with present staff for laydowns and for compilation and draughting will be four hundred 20-chain sheets per year. Several changes were made in equipment, and especially in methods, to increase production in the air-photo unit, the laydown section, and the compilation and draughting sections.

At the start of a new decade, the Division is in good condition to take part in the work of the 70's, which will be the air photography, survey control, and mapping of the northern half of the Province where the mining and forestry industries are already pressing into the wilderness.

FLYING OPERATIONS

Some camera unserviceability was experienced with the Zeiss camera during a period of heavy flying in June. The problem was a breakdown in a main-drive motor and in a blower motor; however, replacements were obtained with no loss of photography, and spare motors of each type are now stocked in our Instrument Shop.

Again this year Highways Department provided one pilot and the Division hired one for the six-month season. For the leased aircraft a pilot, co-pilot, and engineer were hired and the navigator and photographer were provided from our staff. This Lear Jet aircraft has a top speed of 600 m.p.h., a range of 1,200 miles, and will climb at 5,000 feet per minute with a ceiling of 48,000 feet. Operationally, in 100 hours' flying-time there was no unserviceability and, apart from a new battery, no field maintenance was required. A feature of the aircraft was its high speed and all-weather IFR capability; the crew could be on photography at the limits of the Province within one hour and 40 minutes out of Victoria. The jet was vibration free and the camera leveling mount was bolted to the air frame; there were no stability problems; course corrections were almost instantaneous. Ferry trips were made at the optimum ceiling 35,000 feet and the aircraft descended to 20,000 feet, where photography was carried out at 400 m.p.h. The Zeiss navigation sight, after modification, was perfectly matched to this unexcelled photographic airplane.

Both Beechcraft continued to function well. CF-BCE had an engine change at the end of August and also developed a leaking gas tank late in the season, which will be repaired during the annual winter maintenance period.

With the exception of a bright clear 10-day period in early June, photographic weather was not favourable, and in the northern latitudes almost non-existent in the mid-summer months. As a consequence, the utilization in July and August of the Lear aircraft in the northern area was limited; it did, however, accomplish large blocks of revision photography in the south.

A record accomplishment was achieved during the 10-day period already mentioned during which the two Beechcraft flew a total of 140 hours and took some 15,500 photographs.

Total hours flown	677:40
Total square miles photographed	67,080
Total number of photographs	39,558

Photography was completed all or in part for 106 out of a total of 120 projects.

With the greatly increased service ceiling of the jet, some 1 mile to 1 inch photography was done in the Peace River area and 1 mile and one-half to 1 inch photography was done on the Lower Mainland and southern Vancouver Island with success.

In last year's report it was stated that the northern part of the Province has the least amount of photographic weather. This fact was vividly portrayed this year when in the Dease Lake-Stikine area, between the middle of June and the beginning of September, there were only two part-days when it was clear enough to undertake photography. It is evident that if this part of the Province is to be covered with new photography within the time period originally outlined, it can only be done with high-speed aircraft in order to get into the area quickly and to achieve the maximum production possible during the limited duration of clear weather. For complete air-photo coverage of the Province, the reader is referred to Key Maps 15 to 18 contained in envelope attached to back cover of this Annual Report.

PROCESSING

The 1969 season began in March when 12 rolls of film were exposed. April was a month of poor weather and no further photography was taken until early May. A total of 173 air films, including 10 colour films, was exposed during the season.

Early May saw the installation of the Kodak Versamat film processor. This processor handles film of all sizes from 16 mm. up to 9½ inches in rolls and sheet film from 4 by 5 to 11 by 14 inches. After a two-week working-in period, good results were obtained on all our air film.

Prints on a waterproof-base paper are also very quickly and efficiently handled in this processor, one feature being that prints end up in the basket in order, doing away with the necessity of hand sorting afterwards. This feature applies only to orders for complete rolls, small one or two-print orders having to be separated by hand, although they are in sequence. The flight information is shown automatically on all prints, including the date of exposure which has eliminated the manual chore of date-stamping on the back of each print.

The month of April showed a drop in production. This was due to the need for a complete rewiring of the Process Laboratory to accommodate the installation of the Versamat automatic processor. After a three-day period endeavouring to keep production going while allowing the electricians to do their work, it was decided to shut down completely for four days. As a result, a new power supply was also installed, controlled from a central panel, a great improvement.

Also in the month of May a night shift was instituted for a period of three weeks. A three-man crew began work at 4.30 p.m. and continued until 12 p.m. to cut down some of the tremendous backlog of small print orders for public use. The month ended with a total of over 27,600 prints. The use of the Versamat processor and waterproof prints had a great deal to do with this record output.

An overtime shift for two weeks during the month of July and the use of the Versamat for print processing again showed a substantial increase in production. The total for the month of July was 28,995.

Two of the junior personnel left at the end of July and two more, one a female assistant, were taken on. A second female employee started in September, but left in November. November 12th saw the unexpected loss of a long-time member of the Process Laboratory staff. C. D. Hobson died suddenly, having been one of the staff for 20 years.

One of the electronic printers was practically out of operation for 10 days during November. The loss of one of these printers for only a few days as well as the loss of a skilled man has quite an effect on the month's production figures, which dropped to a low of 14,000 prints.

The year ended with a total of 253,027 prints.

COMPILATION

The 1969 harvest of air photography for Forest Inventory mapping was 20,000 first-priority prints and 5,000 second-priority prints.

The photography from the Fontas area of North-eastern British Columbia came in early May, giving the compilation section a running start in its attempt to produce 600 compiled map-sheets for the Forestry Inventory Division. Photography from the other areas came in at a steady rate through the season and although the Botanie area was not included in the programme until September, it was completed by October.

In an effort to produce 600 map-sheets in the 1969/70 season, the Compilation Section has streamlined its procedure; the raying-in process has been eliminated and, in place of duplicate photos, the originals will be given to the Forestry crews for all areas that can be mapped by April of each year. Full use is being made of all existing mapping and by December 31st all 19,500 first-priority photos were through the template laydown stage and approximately 325 maps were detail-plotted. At the present time, mapping personnel are being diverted from laydown to detail plotting. Considering all aspects of 1969, it has been a most successful and productive year.

1969 ends with 5,000 second-priority photos on hand; therefore, the Compilation Section has a good start. Two problems must be faced in 1970—first, the vast areas to be mapped have virtually no control, a major problem for this section, and second, the Division continues to lose senior mapping personnel. These people cannot be replaced from the outside and the past turnover of junior personnel increases the problem of in-service training.

DRAUGHTING

The Draughting Office has completed another productive year; the regular duties pertaining to the mapping of some 15,000 square miles for the Forest Inventory Division were interspersed with many special and interesting assignments.

For the Timberland Appraisers of the Taxation Branch, the redrawing of the Esquimalt and Nanaimo Railway Land Grant was undertaken at a scale of 20 chains to 1 inch, with its complicated process of fitting and adjusting the existing cadastral surveys to the newly surveyed and alienated blocks.

To facilitate this request, four university students were recruited for the summer months to allow experienced personnel to proceed with this exacting work. A separate drawing office was borrowed to accommodate the students; trained under a capable supervisor, their contribution was notable.

By using the skills of photogrammetry and mapping, the Draughting Office was able to provide answers to several problems presented by the Lands Branch in matters of land accretion, the proposed subdivision of Crown lands, pinpointing the

position of lots on aerial photographs, and the computing of areas with irregular boundaries.

Because the requirements for lot compilation are decreasing as the Forest Inventory Division moves into Northern British Columbia, and because changes in the mapping procedure have been effective, there has been an increase of 65 per cent in the number of control sheets handled by the Draughting Office.

Another 37 map-sheets were produced at 40 chains to 1 inch by means of reducing the newer 20-chain sheets as a quick means of revising the original 40-chain sheets.

Several mosaics were prepared; there is an increasing demand for this method of presenting air-photo information.

New employees and students continue to visit the Air Division for purposes of orientation and education; although this is a time-consuming process, it appears to be extremely worth while. This year the visitors included the engineering students of the Royal Roads Cadets, a fourth-year class of engineering students of the Faculty of Foresty at the University of British Columbia, a class of senior-secondary students from a Duncan high school, the map-draughting students from the Vocational School in Victoria, and the recent employees of the Forest Service, together with employees of the Forest Engineering Section. In the same theme, members of this office contributed to an informative lecture on the use of aerial photographs at various city schools.

20-chain Control and Compilation by Map-sheets, 1969

	Compilation	Control
Botanie	----	9
Kingcome	----	85
Nicola	----	34
Stuart Lake	51	181
E. & N.	----	87
Lakelse	----	11
Moberly	17	21
Kotcho	----	166
Fontas	23	149
Vancouver	4	5
Totals	95	748

INSTRUMENT-SHOP

The Instrument-shop completed 107 projects during the year. These projects include design, construction, and maintenance of equipment used for field work, photographic processing, and mapping. Successful completion of such a wide variety of tasks speaks well for the versatility, ingenuity, and technical competence of the shop staff.

Field Equipment

A navigation sight, identical to the one designed and built in this shop a few years ago for survey aircraft CF-BCD, was constructed for CF-BCE. While on the subject of navigation sights it is interesting to note that the new Zeiss NT-1 navigation sight was modified for use in a pressurized aircraft. In order to do this it was necessary to find a method which would provide the required pressure-seal, and then carry out this work as well as designing a vacuum tank so the pressure-seal could

be tested. The operational problems were condensation, icing (at 50,000 feet the outside air temperature was in the order of —64° F.), and the 7 p.s.i. pressure differential. The sight was shortened, sealed at both ends, and filled with dry nitrogen. Both sights performed well during the field season this year.

The camera mount which was leased with the Lear Jet broke very early in the field season, so this shop was called upon to make emergency repairs to the mount.

Annual preventive maintenance was carried out on the Division's four aerial cameras.

Out of 18 pairs of binoculars evaluated or repaired for the Forest Service, 12 pairs were found to be uneconomical to repair and six pairs were adjusted or repaired.

Also for the Forest Service, new mounts for the 70-mm. Linhof cameras were fabricated on the helicopter boom. The new mounts were required so that the Linhof cameras could be removed from the boom and replaced without loss of relative orientation.

Photographic Processing Equipment

The main feature was the purchase by the Air Division of a Kodak Versamat continuous processor. This shop was responsible for the planning and modification of the Process Laboratory in preparation for the installation of this processor. It also worked closely with the Photographic staff for the initial sensitometry and operation of the machine.

In addition to the just-mentioned modifications, the shop participated in the upgrading of the facilities in the enlarging room by designing new stainless-steel processing and washing sinks and by building a carriage-type support for the new vacuum easel.

Stainless-steel racks for processing ¼-inch-thick glass plates were built for use in the Process Laboratory.

As noted in last year's Annual Report, the production of 35-mm. diapositives from aerial negatives was temporarily discontinued because of a lack of suitable equipment. A recommendation, outlining a method and the equipment required to do this job, was submitted by the shop; subsequently, the equipment was purchased, assembled into a working unit, and delivered to the Process Laboratory.

Maintenance of the two electronic photographic printers proved to be rather time-consuming this year. Five hundred and eighty-three man-hours were devoted to this task during the year; however, one or the other of the printers were actually out of service for approximately one-quarter of this time. A spare amplifier was assembled to facilitate isolation of electrical faults and thus reduce lost printing time.

The electrical problem with the pressure-plate lifting system in the F.F.3 Projection Printer, which was indicated in last year's Annual Report, was rectified in March of this year and no further trouble has been reported. This enlarger was fitted with an Aristo cold-light source in July of this year.

Modification of aerial camera instrument boxes, design of a series of electronic printer masks, and design and construction of special annotation equipment were the Instrument-shop's part in implementing a decision to remove the necessity for stamping the date of photography and "All rights reserved" on the reverse side of each print.

Because of a reallocation of space in the basement next to the Process Laboratory, a large amount of new storage space was required for paper and chemicals within the Process Laboratory itself. The planning of this work was done cooperatively by the laboratory and shop personnel. The resulting construction of shelves, storage racks, and working-tables was undertaken by the shop.

Mapping Equipment

One older-type Episcope which will handle large originals was refurbished and fitted with circular fluorescent lights for use in the Draughting Office.

Seven tables were built for the Mapping Office and the Topographic Division used the shop facilities to construct three L-shaped draughting tables for its own use.

REPORTS

The following reports were prepared during the year:—

Process Laboratory Tempered Water Supply and Requirements.
Saltzman Projection Printer Scale Enlargements.
Versamat Processor Discussion.
Further Notes on Versamat Processor.
Low Contrast Diapositive Batch Developing.
Cold-light Source for F.F.3, Projection Printer.
35-mm. Diapositive Production.
Multiple Printing and Processing of 9-by-9-inch Glass Diapositives.
Report on Tri-X Film.
Process Laboratory Hot Water Requirements.
Preliminary Ilford Film Test.
Report on the Condition of F. 24 Camera Equipment.

STATISTICS

1969 Air Operations Cost Summary by Projects

	Aircraft-hours	Number of Photographs	Accomplishment		Flying Costs	Photographic Costs	Total Costs
			Square Miles	Lineal Miles			
A. 80-chain vertical cover—							
1. New cover—							
Agriculture Department—Peace River area	1:15	65	1,405	.....	$218.87	$153.82	$372.69
Finance Department—Halfway River	2:00	90	2,045	.....	350.18	212.96	563.14
Totals	3:15	155	3,450	.....	$569.05	$366.78	$935.83
Average cost	.....	$6.04	$0.27	.....	.....	.....	.....
B. 40-chain vertical cover—							
1. New cover—Forest Surveys and Inventory Division—Stikine P.S.Y.U.	6:50	350	1,730	.....	$1,196.48	$828.20	$2,024.68
2. Revision—							
Agriculture Department—ARDA Blocks 82 F and K	14:45	535	2,970	.....	2,582.64	1,265.96	3,848.60
Forest Surveys and Inventory Division—Stikine P.S.Y.U.	5:10	315	1,595	.....	904.65	745.38	1,650.03
Geographic Division—							
Block 82 E	18:25	725	3,340	.....	3,224.64	1,715.55	4,940.19
Block 82 F	9:10	290	1,650	.....	1,605.02	686.22	2,291.24
Blocks 92 G and J	8:30	900	4,615	.....	1,488.30	2,129.66	3,617.96
Lands Department—							
Block 82 E	7:30	460	2,340	.....	1,313.20	1,088.49	2,401.69
Block 82 F	6:40	630	3,450	.....	1,167.29	1,490.76	2,658.05
Block 82 G	6:10	475	2,205	.....	1,079.74	1,123.98	2,203.72
Block 82 J	10:00	460	2,515	.....	1,750.95	1,088.49	2,839.44
Block 82 K	2:30	235	1,250	.....	437.73	556.08	993.81
Block 82 L	10:30	305	1,050	.....	1,838.49	721.71	2,560.20
Block 82 N	2:00	140	700	.....	350.18	331.28	681.46

1969 Air Opeations Cost Summary by Projects—*Continued*

	Aircraft-hours	Number of Photographs	Accomplishment: Square Miles	Accomplishment: Lineal Miles	Flying Costs	Photographic Costs	Total Costs
B. 40-chain verticle cover—*Continued*							
2. Revision—*Continued*							
Land Inspection Division—							
Peace River Region	2:30	75	430	.....	437.73	177.47	615.20
Prince George-Quesnel	13:40	690	3,445	.....	2,392.95	1,632.73	4,025.68
Sub-totals	117:30	6,235	33,285	.....	$20,573.51	$14,753.76	$35,327.27
3. Improvement flying—Block 82 G	2:45	80	340	.....	$481.51	$189.30	$670.81
Totals	127:05	6,665	35,355	.....	$22,251.50	$15,771.26	$38,022.76
Average cost	.....	$5.70	$1.08	.....	.....	.....	.....
C. 20-chain vertical cover—							
1. New cover—Forest Surveys and Inventory Division—							
Fontas P.S.Y.U.	73:55	6,910	8,875	.....	$12,942.34	$16,351.00	$29,293.34
Kingcome P.S.Y.U.	11:00	840	835	.....	1,926.04	1,987.68	3,913.72
Moberly, P.S.Y.U.	24:35	2,500	2,450	.....	4,304.39	5,915.70	10,220.09
Takla P.S.Y.U.	46:30	4,835	5,330	.....	8,141.86	11,440.98	19,582.84
Wapiti P.S.Y.U.	14:50	605	675	.....	2,597.22	1,431.60	4,028.82
Sub-totals	170:50	15,690	18,165	.....	$29,911.85	$37,126.96	$67,038.81
2. Revision—							
Forest Surveys and Inventory Division—							
Botanie P.S.Y.U.	24:25	2,015	2,225	.....	$4,275.21	$4,768.06	$9,043.27
Kingcome P.S.Y.U.	13:00	1,185	1,500	.....	2,276.23	2,804.04	5,080.27
Nicola Barton P.S.Y.U.	22:25	1,350	1,430	.....	3,925.01	3,194.48	7,119.49
Quesnel Lakes P.S.Y.U.	9:40	565	565	.....	1,692.57	1,336.95	3,029.52
Skeena P.S.Y.U.	2:50	160	180	.....	496.10	378.60	874.70
Stuart P.S.Y.U.	30:20	2,145	2,200	.....	5,311.18	5,075.67	10,386.85
Vancouver P.S.Y.U.	9:35	485	470	.....	1,677.97	1,147.65	2,825.62
Willow-Naver P.S.Y.U.	9:05	380	425	.....	1,590.44	899.19	2,489.63
Sub-totals	121:20	8,285	8,995	.....	$21,244.71	$19,604.64	$40,849.35
Finance Department—							
Cameron River	3:25	190	195	.....	$598.23	$449.59	$1,047.82
Quadra Island	7:00	500	600	.....	1,225.66	1,183.14	2,408.80
Mines Department—Highland Valley	3:15	270	320	.....	569.05	638.90	1,207.95
Sub-totals	13:40	960	1,115	.....	$2,392.94	$2,271.63	$4,664.57
Totals	305:50	24,935	28,275	.....	$53,549.50	$59,003.23	$112,552.73
Average cost	.....	$4.51	$3.98	.....	.....	.....	.....
D. Special projects—							
Agriculture Department—							
Fraser Valley Soils Study	3:25	168	.....	260	$598.24	$397.54	$995.78
Port Renfrew Soils Study	6:35	300	.....	72	1,152.71	709.89	1,862.60
University of British Columbia Soils Study	1:15	20	.....	5	218.87	47.32	266.19
British Columbia Hydro—Arrow Lakes	4:40	170	.....	130	817.11	402.25	1,219.36
Finance Department—							
Arrow Lakes	4:25	185	.....	130	773.34	437.77	1,211.11
Coldstream	1:30	80	.....	52	262.64	189.30	451.94
Garibaldi-Green Lake	1:00	87	.....	44	175.09	205.87	380.96
Hope	1:00	66	.....	44	175.09	156.17	331.26
Keates Island	:15	7	.....	5	43.77	16.56	60.33
Salmon Arm	2:20	152	.....	80	408.56	359.68	768.24
Skookumchuck	1:00	24	.....	16	175.09	56.79	231.88
Spallumcheen	1:00	210	.....	128	175.09	496.93	672.02
Thormanby Island	:30	7	.....	4	87.55	16.56	104.11
Geographic Division — Vanderhoof-Fort St. James	1:00	58	.....	22	175.09	137.24	312.33
Forest Engineering—							
Adams Harbour	1:00	24	.....	19	175.09	56.79	231.88
Duncan River	2:40	80	.....	48	466.92	189.30	656.22
Houston-Topley	:45	32	.....	26	131.32	75.72	207.04
Lillooet River	:50	10	.....	8	145.91	23.66	169.57
Mica Pondage	3:00	86	.....	61	525.28	203.50	728.78
Forest Protection—Kitimat	2:00	92	.....	60	350.18	217.70	567.88
Forest Public Relations—Duncan Nursery	2:00	6	.....	2	350.18	14.20	364.38
Forest Research—Blaeberry River	2:15	100	.....	27	393.96	236.63	630.59

1969 Air Operations Cost Summary by Projects—*Continued*

	Aircraft-hours	Number of Photographs	Accomplishment		Flying Costs	Photographic Costs	Total Costs
			Square Miles	Lineal Miles			
D. Special projects—*Continued*							
Highways Department—							
Ferry terminals	4:40	90	.....	20	$817.11	$212.96	$1,030.07
Natal Slide	6:45	20	.....	3	1,181.88	47.32	1,229.20
Squamish Slide	2:40	175	.....	73	466.92	414.11	881.03
Lands Department—							
Bartow Creek	:30	7	.....	4	87.55	16.56	104.11
Lillooet Lake-Driftwood	1:30	18	.....	12	262.64	42.59	305.23
Cheakamus Valley	2:30	42	.....	33	437.73	99.38	537.11
Okanagan Lake	4:30	417	.....	49	787.93	986.75	1,774.68
Manning Park	1:55	5	.....	3	335.59	11.83	347.42
Post Creek	:45	9	.....	5	131.32	21.30	152.62
Prince George-Yellowhead	4:20	181	.....	146	758.75	428.30	1,187.05
Ring Creek	:30	7	.....	4	87.55	16.56	104.11
Roberts Bank	1:35	18	.....	18	277.23	42.59	319.82
Saanich Peninsula	3:10	296	.....	168	554.47	700.43	1,254.90
Williston Lake	2:15	65	.....	185	393.96	153.81	547.77
Land Inspection Division—							
Babine Lake	1:15	130	.....	109	218.87	307.62	526.49
Babine-Burns Lake	:45	45	.....	20	131.32	106.48	237.80
Booming-grounds	1:00	38	.....	15	175.09	89.92	265.01
Fulton Lake	:45	26	.....	18	131.32	61.52	192.84
Granisle Townsite	:30	15	.....	12	87.55	35.49	123.04
Nelson Island	:45	19	.....	6	131.32	44.96	176.28
Northern Trans-Provincial Highway	1:00	108	.....	79	175.09	255.56	430.65
Redonda Island	:50	7	.....	4	145.91	16.56	162.47
Tatlapan Lake	1:00	53	.....	40	175.09	125.41	300.50
Legal Surveys Division—Kootenay Lake	1:30	9	.....	2	262.64	21.30	283.94
Municipal Affairs Department—Kimberley	1:30	50	.....	24	262.64	118.31	380.95
Public Works Department — Provincial Building site	1:45	9	.....	1	306.41	21.30	327.71
Recreation and Conservation Department—							
Bowron Lakes	:45	17	.....	22	131.32	40.23	171.55
Champion Lakes Park	:30	10	.....	7	87.55	23.66	111.21
Crooked River Park	:15	8	.....	6	43.77	18.93	62.70
Garibaldi Park	1:00	75	.....	56	175.09	177.47	352.56
Manning Park	:30	7	.....	5	87.55	16.56	104.11
Rathtrevor Beach Park	:30	6	.....	2	87.55	14.20	101.75
Wells Gray Park	:30	28	.....	21	87.55	66.25	153.80
Wickaninnish Park	4:00	285	.....	69	700.37	674.39	1,374.76
Topographic Division—							
Deadman Pass	4:00	12	.....	4	700.37	28.39	728.76
Ortho-photo test	6:00	77	.....	85	1,050.56	182.20	1,232.76
McBride	1:30	21	.....	19	262.64	49.69	312.33
Transport Department—Campbell River air-accident site	3:30	118	.....	14	612.83	279.22	892.05
Water Resources—							
Chilako River	:45	36	.....	18	131.32	85.19	216.51
Creston Soil Study	7:35	198	.....	45	1,327.79	468.52	1,796.31
Fraser River low water	2:00	74	.....	95	350.19	175.10	525.29
Liard River	5:00	52	.....	34	875.47	123.05	998.52
Lower Fraser Valley	11:40	2,294	.....	1,225	2,042.75	5,428.26	7,471.01
Nakina-Taku Rivers	9:50	20	.....	12	1,721.75	47.32	1,769.07
Shuswap River	6:50	402	.....	102	1,196.47	951.25	2,147.72
Western Canadian Universities—Barclay Sound	2:25	66	.....	18	423.14	156.17	579.31
Internal—							
Nakusp	:05	1	.....	2	14.59	2.37	16.96
Sidney	:10	6	.....	2	29.18	14.20	43.38
Three universities	1:15	13	.....	4	218.87	30.76	249.63
Vancouver	:10	2	.....	1	29.18	4.73	33.91
Vancouver high altitude	4:30	64	.....	240	787.93	151.45	939.38
Victoria airport	:10	3	.....	2	29.18	7.10	36.28
Victoria—Malahat	1:15	8	.....	30	218.87	18.93	237.80
Whistler Mountain	2:00	77	.....	12	350.19	182.21	532.40
Totals	173:15	7,803	.....	4,448	$30,334.98	$18,464.09	$48,799.07
Average cost	.....	$6.25	.....	$10.97	.....	.....	.....

1969 Air Operations Cost Summary by Projects—*Continued*

	Aircraft-hours	Number of Photographs	Accomplishment		Flying Costs	Photographic Costs	Total Costs
			Square Miles	Lineal Miles			
E. Miscellaneous flying—							
Internal—							
Film and camera test	11:15				$1,969.80		$1,969.80
Oblique photography	2:05				364.78		364.78
Training[1]	31:25						
Aircraft maintenance[1]	23:30						
Totals	68:15				$2,334.58		$2,334.58
Grand totals	677:40	39,558	67,080	4,448	$109,039.61	$93,605.36	$202,644.97[2]

[1] *Cost of maintenance and training charged to all projects.*
[2] Includes $75,927.91 for two-month lease and operation of a Lear jet.

Orders for Standard Prints (9 by 9 Inches) from British Columbia Negatives, 1969

	Reprints	Loans
Public—		
Individuals	5,087	3,039
Companies	2,324	752
Mining	32,421	13,924
Universities and schools	12,805	864
Towns and cities	4,108	109
Commercial air surveys	5,769	1,725
Real estate	419	162
Forest industries	16,987	3,867
Totals	79,920	24,442
Federal Government—		
Mines and technical surveys	39,513	100
Fisheries	5,505	182
ARDA	7,005	16,562
Miscellaneous	1,099	460
Totals	53,122	17,304
Provincial Government—		
Lands Service	9,548	346
Surveys and Mapping Branch	23,605	26,973
Water Resources Service	4,067	1,806
Forest Service	69,609	10,915
Department of Highways	3,320	3,161
Department of Finance	3,674	377
Department of Agriculture	2,508	63
Department of Mines	2,186	270
British Columbia Hydro and Power Authority	623	67
Regional Planning Board	4	488
Department of Recreation and Conservation	690	987
Miscellaneous	151	176
Totals	119,985	45,629
Grand totals	253,027	87,375

Public Loans and Reprints

	1965	1966	1967	1968	1969
Loans	13,033	15,680	13,123	13,127	24,442
Reprints	53,141	61,276	50,918	60,794	79,920
Totals	66,174	76,956	64,041	73,921	104,362

Letters Inward and Loans

Letters inward	3,621
Loan service requisitions	554
Loan fees	$5,859

Revenue

Cash sales	$7,935.36
Land accounts	109,892.73
Total	$117,828.09

Production Record to 1969, Process Laboratory

	1946–1966	1967	1968	1969	Grand Total
Processing completed—					
Air films—					
R.C. 8, O.S.C., Zeiss	639.5	140.5	105.5	163	1,048.5
F24 and Eagle	2,829	3	5	4	2,841
F24, F8, K20 obliques	75.5	.....	10	8	93.5
Test rolls	28	1.5	.5	.....	30
Colour—R.C. 8 and Zeiss	8.5	5	8	10	27
70 mm.—black and white ft.	3,535	1,200	600	1,100	6,435
70 mm.—colour ft.	750	.....	.....	700	1,450
Topographic (116)	4,039	.....	.....	67	4,106
Dominion Hydrographic K20	9	3.5	1	2	15.5
Printing completed—					
Standard prints (5″ x 5″ enlarged to 10″ x 10″)	1,963,516	39,810	27,236	56,121	2,086,683
Contact prints (5″ x 5″)	46,087	.....	184	.....	46,271
Kendra prints (9″ x 9″ reduced to 5″ x 5″)	4,132	.....	.....	.....	4,132
Contact prints, Cintel and Milligan (10″ x 10″)	617,148	144,717	177,651	196,906	1,136,422
Contact prints, colour (10″ x 10″)	.....	.....	.....	64	64
Contact prints (20″ x 24″ and larger)	3,781	2	56	51	3,890
Enlargements (up to 40″ x 96″)	29,333	1,301	1,363	1,534	33,531
Topographic (11″ x 14″)	23,688	66	.....	.....	23,754
Lantern slides (2″ x 2″ (stereo and 35 mm.))	384	.....	17	237	638
Autopositive films (up to 40″ x 42″)	8,284	228	172	218	8,902
Film transparencies (up to 40″ x 46″)	1,438	182	297	324	2,241
Film transparencies (photo drawings)	.....	19	.....	.....	19
Kelsh, A7, A8, plates, films, and miscellaneous ground negatives	5,248	980	875	1,072	8,175
Requisitions completed	40,282	3,976	4,085	3,907	52,250

UNIVERSITY ENDOWMENT LANDS

UNIVERSITY ENDOWMENT LANDS

R. P. MURDOCH, PROJECT MANAGER

Mr. M. E. Ferguson, who has served as Project Manager for the University Endowment Lands for the past 26 years, retired on August 15, 1969. Mr. Ferguson's intimate knowledge of the area and his long association with the local residents will be missed by all concerned.

No decision has as yet been made with respect to development of the considerable acreage of raw land in the Endowment area. However, one parcel of privately owned land is now being developed for residential purposes. A proposal from the owners of Block 96 to erect a high-rise apartment building was submitted to the Manager for consideration, but never finalized. Preliminary discussions have also taken place with respect to developing cliff-side apartments along the sloughing cliffs facing Spanish Banks. If this proposal proves to be feasible, the continuing erosion problem along these banks could be arrested while at the same time providing apartment housing which is still in great demand in this area. The availability and cost of capital will no doubt be a major factor if either of the above-mentioned proposals proceed.

The concentrated flow of traffic onto the University of British Columbia campus continues to be a problem. The Department of Highways has installed an additional lane, extending the two lanes on South-west Marine Drive in a north-westerly direction an additional 400 feet. However, until both South-west Marine Drive and 16th Avenue west of Blanca Street are opened up as four-lane divided highways, the major problem of moving 8,000 cars in one direction over a period of approximately one hour each day the university is in session will not be solved.

The fill in No. 1 Ravine has proceeded satisfactorily during this past year and at the present rate the fill should be completed in approximately four months' time.

During this past year a change was made in our scavenging operations. Since April 1, 1969, the garbage has been picked up by a private contractor. The inability of the contractor to operate within his contract price has made it necessary to terminate the contract on March 31, 1970. Arrangements have been made to acquire a garbage-packer unit and operate same by the Endowment Lands staff.

There is a continuing interest by private corporations and entrepreneurs to develop all or part of the University Endowment Lands for various purposes. All proposals have been rejected by Government pending proclamation of the *Universities Real Estate Development Corporation Act.*

The tables hereunder outline the revenues received over the past 10 years and the building activity over the past three years.

University Endowment Lands' Revenue, Excluding General Taxes and Grants, 1960 to 1969, Inclusive

Year	Local Improvement Taxes	Loans	Water	Leases and Sundry Rents	Number 1 Ravine Fill	Garbage, Permits, and Miscellaneous Revenue	Miscellaneous Interest	Total
1960	$7,352.79	$3,123.88	$82,346.14	$16,168.73	.....	$3,337.84	$186.98	$112,516.36
1961	12,427.09	537.87	84,435.63	11,768.33	.....	10,333.27	43.91	119,546.10
1962	10,320.99	.....	86,400.08	15,277.73	.....	11,213.19	16.49	123,228.48
1963	10,384.36	.....	112,994.52	10,653.33	.....	10,443.74	40.17	144,516.12
1964	8,349.54	.....	126,986.47	21,197.34	.....	32,219.69	12.14	188,765.18
1965	8,712.46	.....	117,757.11	34,833.75	.....	32,353.31	74.45	193,731.08
1966	8,825.13	.....	114,098.68	34,799.64	$4,359.90	16,276.16	79.91	178,439.42
1967	17,963.94	.....	135,870.74	49,745.23	2,085.60	33,511.69	122.87	239,300.07
1968	8,961.99	.....	160,610.25	36,148.37	5,151.00	25,151.73	15.00	236,038.34
1969	4,994.21	.....	157,368.01	42,476.19	412.00	11,963.05	19.73	217,233.19
Totals	$98,292.50	$3,661.75	$1,178,867.63	$273,068.64	$12,008.50	$186,803.67	$611.65	$1,753,314.34

Number and Value of Building Permits Issued for the Calendar Years 1967, 1968, and 1969

	1967		1968		1969	
	Number	Value	Number	Value	Number	Value
New dwellings	----	----------	----	----------	1	$75,000.00
New commercial buildings	1	$150,000.00	----	----------	----	----------
New fraternity houses	2	235,000.00	----	----------	1	125,000.00
New students' centre	----	----------	----	----------	1	30,000.00
Alterations to dwellings	10	71,800.00	13	$51,900.00	14	75,771.00
Alterations to schools	1	150.00	----	----------	----	----------
Alterations to commercial buildings	1	16,377.00	3	66,500.00	2	87,000.00
Alterations to churches	----	----------	1	19,000.00	----	----------
Garages, etc.	5	6,648.00	3	1,200.00	3	3,700.00
Swimming-pools	----	----------	2	8,400.00	4	58,000.00
Totals	20	$479,975.00	22	$147,000.00	26	$454,471.00

PERSONNEL OFFICE

PERSONNEL OFFICE

K. M. HANSON, PERSONNEL OFFICER

The year 1969 was a busy one, even though the table below indicates fewer recruitments, reclassifications, and promotions than in the last two years.

	1966	1967	1968	1969
Recruitments for continuous staff	55	55	52	45
Reclassifications	42	39	25	22
Promotions	22	19	24	16
Internal transfers	7	11	2	6
Transfers to other departments	12	17	13	8
Terminations for continuous staff	44	43	40	42
Retirements	5	3	3	1
Short-term casual appointments	58	77	59	52
Transfers from other departments	----	12	8	5

The establishment of the Department was increased during the year by two Clerks 4. These positions have been added to the Land Administration Division (Vault).

In November, 1969, Mr. A. F. Smith was awarded a diploma in public administration, having completed the three-year training plan. Other employees of this Department taking this course include V. G. Knapik, R. F. Oberg, R. A. Paine (third year); G. H. Wilson, A. C. Bridge, A. G. Anderson, Fort St. John (second year); W. C. Fry, T. J. Todd, Burns Lake (first year).

Promotions during the year included that of Mr. R. P. Murdoch to the position of Manager, University Endowment Lands, replacing Mr. M. E. Ferguson, who retired effective August 31, 1969, after 33 years of service. As a result of promotions made in the latter part of 1968 at headquarters in Victoria, a number of Land Officers in the District Offices were either promoted or transferred.

In October of this year, Mrs. G. Gaunt, Clerk 4 in the Accounting Division, passed away after a lengthy illness. In November, Mr. C. D. Hobson, Photographic Technician, Air Surveys Division, died while in service. In December, Mr. R. L. Cawston, Technical Land Officer 2, Land Inspection Division, Smithers, died as a result of a hunting accident.

The year as a whole was successful, though it is hoped that a better system with regard to reclassifications can be devised in the future.

MAIL AND FILE ROOM

MAIL AND FILE ROOM

DAVID S. PRESTON

Letters received in the Department during 1969 amounted to 272,431, compared to 259,246 in 1968. There has been approximately the same percentage increase in letters received for the past three years.

The renovations to the file vault progressed quite favourably and should be completed early in the new year. The new colour-code filing system will then be installed and should serve the Department more efficiently than the previous system.

In our old system of filing it was necessary for the staff to visit three separate offices to collect file or data, whereas, in the new system, a visit to one central location will give the clerks the material or file they require. One of the major advantages of the new system will be a complete record of all files that have been drawn from the vault, whereas in the old system anyone had access, thereby leaving the control of the files without an accurate record.

The colour coding of the files will undoubtedly assist the staff in quick recognition of the particular one they are searching for. Numbers 0 to 9 are each given a colour and wherever a number appears it will be on its own colour bar, and it is anticipated during drawing and searching of files a misplaced colour bar will be easily spotted, thereby eliminating some of the common filing errors.

LETTERS INWARD

Branch	1968	1969	10-year Average, 1960–69
Lands	58,368	64,298	52,658
Forests	141,250	145,536	142,965
Water Resources	34,197	36,706	29,288
Surveys and Mapping	25,431	25,891	22,182
Totals	259,246	272,431	247,093

LETTERS OUTWARD (RECORDED)

Lands	14,933	15,417	14,419
Forests	1,811	1,900	1,964
Water Resources	2,566	*Nil*	*Nil*
Totals	19,310	17,317	16,383

MISCELLANEOUS REPORTS

Designation	1968	1969	10-year Average, 1960–69
Forest-fire reports	1,647	2,318	3,832
Logging-inspection reports	8,418	8,360	12,090
Land-classification reports	6,428	6,137	5,115
Stumpage-adjustment notices	11,664	21,636	6,064
Totals	28,157	38,451	27,101

NEW FILES CREATED

"O" files	7,051	7,727	6,562
Timber-mark files	1,685	1,753	1,522
Timber-sale files	1,128	1,574	1,964
Totals	9,864	11,054	10,048

Micro-film Reference, 3,082.

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