

FEDERATED MALAY STATES.

REPORT ON THE SURVEY DEPARTMENT
FOR THE YEAR 1923.

The cost of the Survey Department for 1923 is summarised as follows:

	Gross Expenditure.	Reimbursement and Revenue.	Nett Expenditure.
Revenue Account ...	\$1,295,191	\$230,997	\$1,064,194
Capital Account ...	220,588	78,752	141,836
Total ...	\$1,515,779	\$309,749	\$1,206,030

(From this expenditure a sum of \$26,298 should be subtracted being arrears of salaries paid for 1922 consequent on the adoption of the new Salary Scheme for the subordinate staff leaving a total nett expenditure of \$1,179,732.)

Excluded from reimbursements and revenue is \$21,411 expenses incurred for the Government Town Planner and \$108,941 ordinary alienation surveys for which, under instructions, no fees were collected. If these amounts were added to reimbursements and revenue, the total would be \$440,101 and the nett expenditure \$1,075,678.

The figures for 1922 were:

\$1,575,510 ... \$313,150 ... \$1,262,360

2. The reimbursements and revenue are made up as follows:

Straits Settlements ...	...	...	\$ 98,668
Singapore Improvement Trust ...	...	...	17,982
Unfederated States ...	...	...	13,888
Survey Fees ...	...	...	130,380
Printing and Sale of Maps ...	...	...	46,047
Instrument Repairing ...	...	...	2,784
			\$309,749

3. The details of expenditure on revenue and capital accounts are shown in Tables I and II, and the distribution of expenditure in Table III.

TABLE I.
COMPARATIVE RETURN OF SURVEY EXPENDITURE
(ACTUAL AND ESTIMATED).

	Estimated, 1923.		Expenditure, 1923.	
	Details.	Totals.	Details.	Totals.
	\$	\$	\$	\$
Personal Emoluments ...	807,069	...	919,155	1,046,719
Temporary Allowances ...	287,312	1,094,381	127,564	
Other Charges.—				
<i>Annually Recurrent.—</i>				
Allowances: Bicycle, Motor Car and Motor Cycles ...	25,008	...	10,759	...
Allowances: Field and Transport ...	90,000	...	100,552	...
Contingencies ...	4,000	...	5,257	...
Contribution to Telephone Exchange	1,000	...	760	...
Expenses of Officers on Transfer ...	5,000	...	2,025	...
Instruments and Materials ...	25,000	...	31,139	...
Maintenance of Boats ...	1,000	...	493	...
Supply of Electric Current ...	3,000	...	2,190	...
Survey and Demarcation Expenses	285,000	439,008	280,831	434,006
Typewriter ...	...	...	...	175
Clerical Service ...	30,840	...	31,567	...
Temporary Allowances (Clerical Service) ...	4,260	35,100	3,312	34,879
Gross expenditure ...	...	1,568,489	...	1,515,779
Subtract Capital Account Table II ...	...	...	...	220,588
Revenue Account ...	...	...	...	1,295,191

* Includes \$26,298 arrears for 1922.

TABLE II.
CAPITAL ACCOUNT.

	Expenditure, 1923.	
	Details.	Totals.
	\$	\$
Personal Emoluments ... ..	...	81,675
Temporary Allowances ... ..	...	11,635
Arrears, 1922 ... ..	...	2,418
Other Charges.—		
<i>Annually Recurrent.—</i>		
Allowances: Field and Transport	33,759	...
Survey and Demarcation Expenses	80,740	...
Allowances: Bicycle, Motor Car and Motor Cycles	2,488	...
Contingencies	1,578	...
Instruments and Materials	6,295	124,860
	...	220,588

TABLE III.
DISTRIBUTION OF EXPENDITURE.

	Total Expenditure.		Reimbursement and Revenue.		Nett Expenditure.	
	\$	\$	\$	\$	\$	\$
Surveyor-General's Office ...	51,208	...	18,564	...	32,644	
Central Drawing Office ...	30,190	}	46,047	...	43,967	
Photo-litho. Section ...	59,824					
Instrument Repairing Section	19,372	...	2,784	...	16,588	
Officers on leave	87,003	...	...	...	87,003	
Transfer of Officers	2,025	...	...	...	2,025	
Salary of Officers employed by Government Town Planner	4,620	...	...	...	4,620	
		254,242		67,395		186,847
Trigonometrical Survey Branch	74,570	...	23,818	...	...	50,752
Topographical Survey Branch	224,123	...	78,852	...	...	145,271
Revenue Survey Branch—						
Selangor	206,176	...	50,436	...	...	155,740
Perak	372,588	...	54,129	...	...	318,459
Negri Sembilan	174,339	...	24,635	...	...	149,704
Pahang	209,741	...	10,484	...	...	199,257
		1,261,537		242,354		
Totals ...	...	1,515,779	...	309,749	...	1,206,030

CENTRAL DRAWING OFFICE.

The office was in charge of Mr. C. de Silva, Technical Subordinate, Special Grade, from the 1st January to the 7th August when Mr. E. Shadgett, the newly-appointed Chief Draftsman, arrived from England and assumed control. An increase in the quality and quantity of the output was immediately effected.

The principal work on which the staff was engaged consisted of a revision of 16 standard topographical 1 mile sheets.

The drawing for reproduction by photo-lithography of the 4-chain topographical survey of Singapore.

Fourteen sheets of the 4-inch topographical survey of Singapore Island.
 A reconnaissance map of the Kuantan-Kemaman area 1-inch to the mile.
 A revision of the British Malaya Map 8 miles to the inch.
 A 20-mile map of British Malaya showing roads and alienated land.
 Districts maps of Ulu Langat, Kuala Selangor and Klang, 1 mile to the inch.
 Five 1-chain sheets of Kuala Lumpur.
 Nine 16-chain sheets of Perak.
 Ninety 8-chain sheets of Selangor and Pahang.
 Geological maps of Langkawi and Singapore Islands.
 Seventeen posters and 14 miscellaneous plans for exhibition purposes.
 Completion of the 4-inch map of Kuala Lumpur and environs.
 Numerous tracings and plans for various Government departments.
 The number of requisitions completed was 366 against 343 for the preceding year.
 The effective strength of the staff was 40.
 One draftsman was dismissed for absence without leave and general inefficiency.

PHOTO-LITHOGRAPHIC BRANCH.

Mr. T. R. Black, Superintendent, was in charge until April when he retired from Government service. He was succeeded by Mr. W. D. Mavor, Chief Assistant.

The Assistant Lithographer, Mr. W. H. Noble, proceeded on long leave in August and the branch has been run single-handed for the remainder of the year.

The output has considerably increased both in quality and quantity, the latter far exceeding any previous year.

During the first two months, the branch was engaged in the printing of rubber coupons. Approximately 2,000,000 were completed. Apart from this the catalogue of work done was substantially the same as that of the Central Drawing Office, which, with the Photo-Litho Branch, forms the map-producing part of the department.

There was a large demand for work by other departments as well as by the public. This demand is increasing and more accommodation is urgent. This will be provided in 1924.

Notable productions are the new 1-mile series of topographical maps showing hill features more clearly and the 4-inch map of Kuala Lumpur and environs.

The number of copies of maps, lithos, etc., produced was 373,526, an increase of 152,418 over the total for 1922.

Five hundred and forty-nine negatives and 1,243 helios and vandykes were taken.

The value of the work produced was \$73,549, an increase of \$23,930 over the previous year.

The effective strength of the staff was 41.

INSTRUMENT MAKING AND REPAIRING SECTION.

This section has continued to be of the greatest service to the department, and the output has considerably increased.

The revenue collected forms no criterion of its value.

Necessary repairs and overhaul are given to every instrument in use in the department. In addition to current repairs, many articles formerly indented for from England are now made, such as leather cases for various types of instrument boxes, slope indicators, spirit levels, parallel rulers, typing tripods, plane-tables, sight rules, trough compasses, tripod and level staves, etc. In all cases there is a reduction in cost of 30 to 40 per cent. as against the imported article.

The number of requisitions dealt with amounted to 486 compared with 352 in 1922.

Mr. W. J. Austen was in charge throughout the year with an effective subordinate staff of 15.

THE TRIGONOMETRICAL BRANCH.

This branch was controlled from head-quarters.

The principal work was the reconnaissance map of north-east Pahang, between the Kuantan and Kemaman rivers with an extension northerly into Trengganu (at the request and cost of the Trengganu Government). Mr. W. H. E. Neil was in charge assisted by six Malay mandors.

The area covered was 935 square miles.

The selection, clearing and beaconing of the hills in Trengganu for the primary triangulation, undertaken at the request and cost of the Trengganu Government: Mr. J. H. Spowers in charge.

The completion of the Control Survey for Malacca under Mr. C. J. Dunn, a number of control traverses in Perak to govern a new compilation, and the fixation of new trigonometrical points in Pahang for revenue survey control.

The appointment of Superintendent remained vacant throughout the year.

TOPOGRAPHICAL BRANCH.

This branch continued under the direction of Mr. J. N. Sheffield, throughout the year, assisted by Mr. H. C. Abraham (till August), Capt. G. H. Sworder and Mr. A. C. Twyford.

Major W. A. D. Edwardes was on leave from February to November.

The most important work was the completion of the survey of the Island of Singapore on a scale of 4 inches=1 mile; the survey on a scale of one inch=1 mile of the locality known as Cameron's Highlands together with the adjacent country; the continuation of the survey on standard Sheet 2 $\frac{N}{14}$ (Perak) and Town Planning Surveys on large scales in Perak and Selangor for the Government Town Planner, Federated Malay States. Various small surveys were also taken in hand at the request of other departments.

The survey of the Island of Singapore and the outlying islands was completed by the middle of October, an area of 81.2 square miles being covered. As this survey was undertaken at the request and expense of the Government of the Straits Settlements, details concerning it have been included in their report.

CAMERON'S HIGHLANDS.

The survey of the area known as Cameron's Highlands in Pahang (sheet 2 $\frac{N}{10}$) on a scale of 1 inch=1 mile was begun in March, with a view to deciding the suitability of the locality for a hill station. The survey was subsequently extended westwards into Perak to join up with sheets 2 $\frac{N}{9}$ and 2 $\frac{N}{14}$ thus affording data for determining the somewhat difficult question of access. The total area surveyed was 120.8 square miles of which 30.3 are in Pahang, the remainder in Perak. Approximately 5 square miles in Pahang may be regarded as the area likely to be suitable for development as a Hill Station.

The total number of points cleared for observations was 31, many of which will be of use for the 1924 programme.

The total cost was \$55,253. Transport was naturally a heavy item.

Mr. A. C. Twyford was in charge. If staff had been available there would have been two European officers detailed for the survey; one to supervise reconnaissance, triangulation and technical control and the other to arrange transport, distribution of work and financial details. It was a heavy task for one man, and the officer-in-charge is to be commended.

During May, a reconnaissance was made of the country north of Gunong Irau as far as the Ulu Telom valley in Pahang and the Ulu Kinta in Perak. The valley of the Ulu Telom lying at an altitude of 5,000 feet appears suitable for agricultural purposes, but as a Hill Station less suitable than the area selected on the Ulu of the Bertam, referred to as Cameron's Highlands.

The existence of a ledge of fairly flat land of about 300 acres at an altitude of 6,000 feet was observed, north-east by north from Gunong Irau, which agrees in bearing with the area noted by the late Mr. Cameron. This may be the legendary plateau, but until the country still further to the north and north-east is explored, the existence or non-existence of the plateau, and consequently of the best Hill Station possible, cannot be regarded as settled. A reconnaissance will be made early in 1924.

The western approaches to the Highlands as well as to all the country under observation are very rough and precipitous excepting possibly in the valley of the Kampar, and it appears that the existing track from Tapah from the south-west follows the easiest route.

Cameron's Highlands proper, namely some 5 square miles on the Ulu of the Sungei Bertam is a valley surrounded by hills rising from 500 to 1,500 feet above the river level. The Bertam flows through it, discharging itself over Robinson's Falls on the southern boundary. Throughout the year the river maintained a constant flow. From March to October, there was no fog in the valley and but little on the hills below the 5,800 feet level.

There were no serious cases of malaria amongst the staff and the area appears free from fever. In June and July, the staff suffered from swollen feet supposed to be caused by a minute fly, but towards the latter end of the year, the complaint disappeared.

STANDARD SHEETS.

Further work was done on $2\frac{N}{14}$ Perak and extended into $2\frac{N}{10}$, joining up with parties operating in the Cameron's Highlands area.

A commencement was made on $3\frac{L}{4}$ Johore by establishing control points for the 1924 season.

TOWN PLANNING SURVEYS.

During January and February, Mr. Twyford was employed in check and control work for the Singapore Improvement Trust 4-chain plans in view of a proposed 1-chain Town Survey of certain areas of Singapore.

A commencement was made on the 1-chain work, but after .071 square miles had been completed, it was decided that there was insufficient reliable revenue survey data to serve as a basis and further work was postponed. Mr. Twyford was then transferred to the Cameron's Highland's Survey.

*Perak (Surveys for the Government Town Planner, Federated Malay States).—*Town surveys on a scale of 40 inches=1 mile (2 chain) with a vertical interval of 5 feet were carried out at Ipoh throughout the year by Mr. P. Cordner James, a Surveyor attached to the branch from January 1.

An area of .136 square mile on a 2-chain scale was surveyed at Karai (Kuala Kangsar).

Selangor.—Town plan surveys on scales of 80 inches and 40 inches to a mile with a vertical interval of 5 feet were undertaken in Kuala Lumpur and environs. The total area completed in the 80 inches (1 chain) survey was 0.675 of a square mile, two Assistant Surveyors, Grade II, two Assistant Surveyors, Grade III, and one Junior Plane-tableer being engaged upon it for different periods.

The average cost rate per square mile of the one chain work is a little lower than that for 1922.

The area covered by the 40-inch (2 chain) survey was 0.681 of a square mile and was completed by two Assistant Surveyors, Grade III, in about five months.

The cost rate of 2-chain surveys generally works at about one half of that of the one chain surveys.

MISCELLANEOUS SURVEYS.

In March, a survey on a scale of $4''=1$ mile was carried out for the Kapar Drainage Board (Selangor). This comprised running portions of the 25 and 50 feet contours through part of the Klang district.

Ninety miles of contours were surveyed necessitating observing 1,875 clinometer heights. Two Junior Plane-tableers were employed in charge of an Assistant Surveyor and the survey occupied nearly three months. Some very difficult and swampy areas were met with and both the Plane-tableers were eventually laid up with fever.

The cost of this work was \$2,089 to which the Kapar Drainage Board contributed the sum of \$500.

In April, a small survey was undertaken for the Public Works Department at Batu Gajah, in connection with a scheme for a water supply. This involved running lines of a total length of 5.2 miles and observing 72 clinometer heights.

In May, at the instance of the Senior Medical Officer, Perak, a survey was made of Pulau Pangkor Laut, the leper settlement. The scale of the survey was 20 inch=1 mile, vertical interval 10 feet and area 0.516 square miles. One Assistant Surveyor was employed on this for four months. The cost rate was reasonable.

In October, a survey was taken in hand of a portion of Pulau Kuraman (Labuan) on a scale of 20 inches to a mile, vertical interval 10 feet and the area covered being 0.695 of a square mile on the east side of the light-house. This survey was undertaken at the request and expense of the Straits Settlements for the purpose of deciding what steps should be taken in view of a possible obscuration of the light by tree growth on the seaward side of the Island. One Assistant Surveyor was employed on this for six weeks.

REVISION SURVEYS.

In view of the reprinting of the Standard Topographical Sheets in Perak, a certain amount of revision was found to be desirable including the addition of important details such as new roads, etc., which were not in existence at the time of the original surveys.

The sheets which necessitated short visits to the field were $2\frac{N}{9}$, $2\frac{N}{13}$, $3\frac{A}{3}$ and $3\frac{A}{4}$.

A large area was revised on $2\frac{M}{3}$ (Taiping), the work being carried out by a Plane-tableer under training.

TRAINING.

Usual training operations were carried on throughout the year at head-quarters though they were somewhat handicapped by the absence on leave for seven months of Mr. A. Sanmugam, Assistant Surveyor, Grade I, whose special work this is; his place was taken however by Mr. M. Chinniah, Assistant Surveyor, Grade II.

At the beginning of the year there were two apprentices and 12 mandors under training in Taiping; five of the latter were eventually employed with the Cameron's Highlands' party and were reported upon favourably.

Additional training on large scale work for Town Planning Surveys was given to seven Plane-tablers during February and March. Mr. Cordner James also underwent a short special course for the same purpose.

Later in the year a considerable number of applicants of the mandor class (5th Standard Malays) were recruited chiefly from the field parties and a selection will be made of the best men amongst them for training in Plane-tabling. Many of them show good promise and it appears as if the junior field staff of the branch will, to a great extent, have to be built up from this material.

During the year three Junior Plane-tablers and two under training were either allowed to resign or their services were dispensed with.

OFFICE.

The number of Plane-tables mounted, scored and prepared for the various field and training parties during the year was 66.

Other routine work by the Drawing Office staff comprised the compiling of the office progress diagrams, the computation of areas and tracings for reproduction of revision surveys on both large and small scales, particularly on standard sheet 2 $\frac{M}{3}$ (Taiping).

The Drawing Office staff was busy throughout the year and a good deal of overtime was called for. The standard of draftsmanship generally both field and office shows improvement.

The services of one draftsman, Grade III, a Malay, were dispensed with in December, owing to inefficiency.

The following table shows the details of fieldwork on the various scales with the cost rates. In some cases the area is so small that the cost rate and outturn cannot be properly computed and has been left out.

TOPOGRAPHICAL BRANCH.

STATEMENT SHOWING DETAILS OF FIELD-WORK, COST RATES, ETC., 1923.

State.	District.	Description of Survey.	Area completed.	Average monthly outturn per Plane-table.	Total expenditure.	Cost rate per square mile.
			Sq. Mls.	Sq. Mls.	\$	\$
S.S.	Singapore	SCALE, 4" = 1 MILE.				
		Singapore Island and outlying Islands. Vertical Interval 25 feet	81.2	0.84	43,632	537
Pahang and Perak	Ulu Jelai Kinta Batang Padang	SCALE, 1" = 1 MILE.				
		Cameron's Highlands and adjacent country. Standard Sheet 2 $\frac{N}{10}$	120.8	1.7	45,928	380
Perak	Batang Padang	Standard Sheet 2 $\frac{N}{14}$ and Standard Sheet 2 $\frac{N}{10}$ }	49.4	2.81	6,321	128
		Standard Sheet 3 $\frac{L}{4}$ ... ..	...	...	3,241	
Johore	Kota Tinggi					

TOPOGRAPHICAL BRANCH—(cont.)

STATEMENT SHOWING DETAILS OF FIELD-WORK, COST RATES, ETC., 1923—(cont.)

State.	District.	Description of Survey.	Area completed.	Average monthly outturn per Plane-table.	Total expenditure.	Cost rate per square mile.
			Sq. Mls.	Sq. Mls.	\$	\$
		TOWN PLANNING SURVEYS.				
S.S.	Singapore	Checking 20" = 1-mile survey 1922 Singapore Improvement Trust ... ..	...	...	3,082	
"	"	80" = 1 mile (Kalang) (1 chain = 1 inch)	0.071	...	1,455	
		SCALE, 40" = 1 MILE. (2 CHAINS = 1 INCH).				
Perak	Kinta ...	Ipoh Township	1.023	0.132	4,206	4,111
		Ipoh Pasir Puteh area (revised). Vertical Interval 5 feet ...	0.411	0.147	1,575	3,832
"	Kuala Kangsar	Survey of Karai. Vertical Interval 5 feet	0.136	0.042	919	6,831
Selangor	Kuala Lumpur	Sentul and vicinity, Kuala Lumpur, G.T.P. Schemes No. 21 and 23. Vertical Interval 5 feet	0.681	0.074	2,960	4,346
		SCALE, 80" = 1 MILE. (1 CHAIN = 1 INCH).				
"	"	Pudu. G.T.P. Scheme No. 15	0.675	0.039	5,591	8,283
"	"	Brickfield's Road area. G.T.P. Scheme No. 20				
"	"	Sentul. G.T.P. Scheme No. 22. Vertical Interval 5 feet				
		MISCELLANEOUS SURVEYS. SCALE, 4" = 1 MILE.				
"	...	Survey for Kapar Drainage Board	...	...	2,089	
Perak	...	Survey for P.W.D. at Batu Gajah	...	...	72	
		SCALE, 20" = 1 MILE.				
S.S.	Dindings	Pulau Pangkor Laut. Vertical Interval 10 feet	0.516	0.103	1,512	2,930
	Labuan...	Pulau Kuraman. Vertical Interval 10 feet	0.095	...	643	
		REVISION SURVEYS.				
Perak	Kinta and Lower Perak	Detail on Standard Sheets 2 $\frac{N}{9}$, 2 $\frac{N}{13}$, 3 $\frac{A}{3}$ and 3 $\frac{A}{4}$ ... ..	...	...	205	
		Standard Sheet 2 $\frac{M}{3}$ (By Plane-tablers under training)				
"	Larut ...	Scale, 20" = 1 mile. Vertical Interval 10 feet	0.76			
		Scale, 2" = 1 mile	4.65			
		" 1" = 1 mile	35.5			

REVENUE SURVEY BRANCH.

The reports of the Superintendents, giving full details with regard to each State, have been furnished to the Residents. It is not proposed to repeat those details in this report.

The total cost of the Revenue Survey Branch (exclusive of leave salaries) was \$962,844.

Appendix A, shows the state of survey work with reference to requisitions for surveys for the Federated Malay States.

Field work is well up-to-date with the exception of reserves. These, being mainly forest reserves, are surveyed only when other circumstances (such as a special request from the Conservator of Forests, or from the Land Office, or for the need of a control survey) render it advisable.

The figures for forest reserves in Pahang have not been included as the need for survey has not arisen.

The total amount surveyed was:

11,154 lots, 207,713 acres, 383,967 chains, \$325,221 (field cost only).

Office work shows considerable arrears, but this is being rapidly overtaken. The return of work with Settlement Officers amounts to 7,129 lots of 28,731 acres, but this is mainly due to the large amount of native holdings dealt with during the year. The figures being:

11,787 lots of 37,724 acres satisfied (title ready on demand).

6,901 lots of 24,245 acres with Land Office for settlement (native holdings only).

9,281 lots of 26,294 acres surveyed, but drafting and computing not complete.

The total number of titles prepared was 18,809 of which 16,950 were mukim extracts: the balance 1,859 were prepared in duplicate.

The general policy of field operations, apart from current alienation, has been the clearing up of accumulations in outlying districts.

The preparation of an uniform series of compilation sheets on the 8-chain scale for all States was proceeded with and good progress made. Lithograph copies for the use of all Land Offices were distributed. It is expected that the issue will be completed in 1924. The varying scales in former use, viz.: 4, 8, 16 and 32 (except such as are necessary for diagrammatic purposes) will be superseded. This will effect a great saving of time and cost in office procedure as well as providing a new and complete record of alienation for Land Offices.

PERAK DIVISION.

Mr. W. A. J. Wallace was in charge throughout the year. His report shows field work fully up to date in the districts of Selama, Krian, Larut and Matang, and well in hand in Upper Perak, Kuala Kangsar, Kinta, Batang Padang and Lower Perak.

The field cost per chain for all classes of survey was 87 cents, per acre of mining land \$2, agricultural \$1.56 and small holdings \$5.55.

The office prepared and issued 8,685 titles and prepared a further 3,437 to await requisition.

The effective strength was 180.7 against 186.9 in 1922.

SELANGOR DIVISION.

Mr. W. A. Gummer was in charge until August and Mr. F. R. Twiss from August to December.

Field work is well up to date throughout, but there are considerable temporary arrears in the office.

The field cost per chain was \$1, per acre of mining land \$2.20, agricultural \$1.28 and small holdings \$1.80.

The office prepared 3,241 documents of title.

The effective strength was 87.6 against 103.2 in 1922.

NEGRI SEMBILAN.

Mr. E. W. Geyer was in charge until the end of March and Mr. W. H. Hanson from April to the end of the year.

Both field and office work are fully up to date.

A considerable proportion of the staff was employed on the revisionary survey of Malacca. Assistance was also rendered to Pahang. \$9,804 is to be recovered from Malacca and \$1,070 to be debited to Pahang.

The expenditure shown in Table III includes these figures.

The field cost per chain was 88 cents, per acre of agricultural land 80 cents and small holdings \$6.66.

The office prepared 2,123 documents of title. A review of the old plane-table sheets was made and 1,400 were mounted and filed.

The effective strength was 71.78 against 82.84 in 1922.

PAHANG DIVISION.

Mr. H. J. Mackenzie was in charge throughout the year.

The field work is well up to date with the exception of forest reserves which are only dealt with when circumstances render it advisable, but there are still temporary arrears in office. Arrears of native holdings in the outlying districts such as Rompin and in the Ulus of the rivers in north-west Pahang including old and uncharted applications have been dealt with, and for the first time in its history Pahang possesses a survey record of its land alienation.

The field cost was 68 cents per chain, per acre of mining land \$2.82, agricultural 19 cents (abnormal: due to large areas) and small holdings \$3.37.

The effective strength was 92 compared with 98 in 1922.

GENERAL.

Mr. V. A. Löwinger, Surveyor-General, was in charge throughout the year, assisted by Capt. C. J. Perkins, Assistant Surveyor-General, at Head Office.

Mr. J. N. Sheffield, Assistant Surveyor-General, Topography, stationed in Taiping, was in charge of the Topographical Branch.

The Trigonometrical Branch was under the personal direction of the Surveyor-General.

Promotions.

Mr. J. N. Sheffield, Superintendent, was promoted to the rank of Assistant Surveyor-General, Topography (personal), in recognition of his long and valuable service.

Messrs. W. H. Hanson, F. B. Sewell and R. R. Goulding were promoted to Grade Superintendent.

Mr. W. D. Mavor, Photo-Litho Branch, was promoted to be in charge with the new title of Chief Photo-Lithographer.

Recruitments.

Messrs. P. Bonnet, A. Shield, P. H. Goss and Capt. C. C. Best, joined the staff as Surveyors on agreement.

They are all qualified surveyors, holding the Australasian diploma, with war service.

Mr. E. Shadgett from England was appointed Chief Draftsman.

Retirements.

Mr. E. W. Geyer, Superintendent, retired on reaching the age of 55.

Mr. A. A. Campbell, Assistant Superintendent, on reaching the age of 50.

Mr. T. R. Black, Superintendent, Photo-Litho Branch, on abolition of appointment.

Messrs. J. Bowes, Assistant Superintendent, T. D. McLean and R. G. W. Gosset, Surveyors on agreement, also retired.

A conference of Superintendents was held in August at which the Superintendents from the Straits Settlements and Unfederated Malay States were present.

These conferences instituted last year have proved of great value—the interchange of ideas and the discussion of particular and general problems which ensue are of much assistance.

Following the example of the Topographical Branch, a recess of one month for the Revenue Surveys was instituted in which intensive training is given.

The new Salary Scheme for subordinates was put into operation.

The Assistant Surveyor-General inspected Perak and Pahang and the Surveyor-General, Negri Sembilan. The Surveyor-General also attended meetings of the Town Planning Board, Fraser's Hill Committee and the Decentralisation Committee, and visited Trengganu and Labuan by request.

Buildings plans for further Head Office accommodation have been approved. This accommodation is urgently needed.

The Surveyor-General desires to express his appreciation of the whole-hearted co-operation of his administrative staff in maintaining efficiency and reducing expenditure.

C. J. PERKINS, CAPT.,

Assistant Surveyor-General, F.M.S. & S.S.

for V. A. LÖWINGER,

Surveyor-General, F.M.S. & S.S.

STAFF LIST, 31st DECEMBER, 1923.

SURVEYS, FEDERATED MALAY STATES AND STRAITS SETTLEMENTS.

Surveyor-General, F.M.S. & S.S.	\$14,400	...	V. A. Löwinger, July 26th, 1922.
Assistant Surveyor-General, F.M.S. & S.S.	\$12,000	...	C. J. Perkins, August 11th, 1922.
Assistant Surveyor-General (Topography)	\$12,000	...	J. N. Sheffield, July 1st, 1923.
Superintendents	...	...	\$10,800 ... W. A. Wallace, March 8th, 1919. F. R. Twiss, May 16th, 1920. T. Le Fevre, January 1st, 1921. R. L. Buckwell, January 1st, 1921. H. J. Mackenzie, September 1st, 1922. W. H. Hanson, June 26th, 1923. F. B. Sewell, July 1st, 1923. <i>Vacant (Two).</i>
Assistant Superintendents	...	...	\$4,800 ... W. A. Gummer, July 1st, 1914. to J. Griffiths, December 18th, 1916. \$9,600 C. Y. B. Sewell, August 30th, 1917. J. M. Favell, January 1st, 1919. E. Aune, January 1st, 1919. W. F. N. Bridges, January 1st, 1919. A. C. Every, January 1st, 1919. E. A. Kenney, January 1st, 1919. H. A. Dijkerman, January 1st, 1919. W. A. D. Edwardes, January 1st, 1919. F. H. Frodsham, January 1st, 1919. C. A. Rust, January 1st, 1919. H. C. Abraham, January 1st, 1919. R. A. Stubington, January 1st, 1919. C. E. Nugent, January 1st, 1919. W. H. Stubington, January 1st, 1919. T. Kitching, January 1st, 1919. J. H. Spowers, January 1st, 1919. C. E. Bone, January 1st, 1919. C. T. M. Husband, January 1st, 1919. L. D. Meyer, January 1st, 1919. W. H. E. Neil, December 15th, 1923.
Surveyors on Agreement	...	...	\$4,800 ... A. A. Lermitt, February 1st, 1921. to J. D. Purcell, March 17th, 1921. \$7,200 C. J. Dunn, April 19th, 1921. A. C. Twyford, April 21st, 1921. F. F. Byatt, April 23rd, 1921. G. H. Sworder, June 4th, 1921. J. J. Cummins, March 5th, 1923. P. H. Bonnett, August 6th, 1923. P. H. Goss, August 11th, 1923. C. C. Best, August 11th, 1923. <i>Vacant (Nine).</i>
Survey Probationers	...	...	\$3,000 ... C. E. L. Roberts, July 16th, 1921. to W. P. Aylward, July 16th, 1921. \$4,200 <i>Vacant (One)</i>
Chief Draftsman	...	...	\$5,400 ... E. Shadgett, July 6th, 1923.
Chief Photo-Lithographer, Photo-Litho. Section	\$6,000	...	W. D. Mavor, July 12th, 1923. to \$8,400
Photo-Lithographer, Photo- Litho. Section	\$4,200	...	W. H. Noble, June 25th, 1919. to \$6,000
Instrument Repairer, Survey Department	\$4,200	...	W. J. Austen, March 21st, 1914. to \$6,000

SURVEYS, UNFEDERATED MALAY STATES.

KEDAH.

Superintendent of Surveys	...	\$10,800	...	J. Dewar, July 1st, 1920.
Assistant Superintendents	...	\$4,800 to \$9,600	...	W. J. C. Stevens, January 1st, 1919. G. D. Barron, January 1st, 1919.
Surveyors on Agreement	...	\$4,800 to \$7,200	...	F. A. Fendall, February 6th, 1920. O. Watson, April 17th, 1920. P. M. Leckie, October 6th, 1920. H. H. Cobon, November 6th, 1920. B. Cooper, April 9th, 1921. N. A. Middlemas, April 14th, 1921.

JOHORE.

Superintendent of Surveys	...	\$10,800	...	R. R. Goulding, July 1st, 1923.
Assistant Superintendents	...	\$4,800 to \$9,600	...	R. V. Morris, October 16th, 1914.
Surveyors on Agreement	...	\$4,800 to \$7,200	...	G. M. R. Jackson, December 28th, 1920. P. V. Norman, December 28th, 1920. R. F. MacKenzie, December 29th, 1920. A. Shield, August 6th, 1923.

APPENDIX A.

RETURN SHOWING STATE OF SURVEY WORK WITH REFERENCE TO REQUISITIONS.

Details,	Agricultural Lots.			Mining Lots.			Native Holdings.			Town Lots.		Resid. Lots.		Reserves.		Sub-divisions.		Miscellaneous.	
	Req.	Lots.	Acres.	Req.	Lots.	Acres.	Req.	Lots.	Acres.	Req.	Lots.	Req.	Acres.	Req.	Acres.	Req.	Lots.	Req.	Items.
Unsatisfied requisitions on 1st January, 1923	232	28,275	...	172	6,888	...	24,743	74,853	...	463	...	...	407	21,483	...	1,500	...	113
Requisitions received in 1923	307	17,628	...	421	18,977	...	5,673	21,215	...	289	854	282	289	22,735	...	1,139	...	132
Total of above	539	45,903	...	593	25,865	...	30,416	96,068	...	752	854	282	696	44,218	...	2,639	...	245
Requisitions satisfied during 1923	274	23,578	...	379	9,763	...	11,787	37,724	...	152	95	28	297	10,394	...	1,125	...	182
" cancelled during 1923	2	...	...	4	162	...	537	1,549	...	70	...	...	19	2,137	...	174	...	27
" remaining unsatisfied on 31st December, 1923	263	22,325	...	210	15,940	...	18,092	56,795	...	530	759	254	380	31,687	...	1,340	...	36
Total agreeing with total above	539	45,903	...	593	25,865	...	30,416	96,068	...	752	854	282	696	44,218	...	2,639	...	245
Details: Unsatisfied requisitions. Awaiting survey or demarcation } In hand " " } Demarcation awaiting circuit } In Land Office for settlement ... } Awaiting action and in hand } In Survey Offices, viz., computing } and drafting }	...	152	2,539	...	127	11,523	...	1,910	6,256	...	91	759	254	161	24,787*	...	453	...	12
	...	33	3,365	...	...	...	...	6,901	24,245	...	29	...	...	37	1,121	...	429	...	9
	...	78	16,421	...	83	4,417	...	9,281	26,294	...	410	...	...	182	5,779	...	458	...	15
Total unsatisfied requisitions	263	22,325	...	210	15,940	...	18,092	56,795	...	530	759	254	380	31,687	...	1,340	...	36

NOTE.--A requisition is "satisfied" when the work of the Survey Department is so far completed that titles can be supplied when demanded.

* Forest Reserves 19,500 acres.