

FEDERATED MALAY STATES.

REPORT ON THE SURVEY DEPARTMENT FOR THE YEAR 1913.

GENERAL ABSTRACT.

1. The main triangulation of Kelantan was commenced and about half completed when further progress was stopped by the north-east monsoon. The progress of this work was impeded also by an outbreak of small-pox. Other work carried out by the Trigonometrical Branch during the year consisted chiefly in the continuation of the precise levelling and of the primary traverse of the Pahang river. A portion of the watershed of the main range forming the boundary between Selangor and Pahang was also accurately traversed and marked, and minor triangulation commenced in Upper Perak for the control of topographical work.

The Topographical Branch continued work in Perak and the Colonial Survey Section in the Negri Sembilan. A survey, partly on large scales, of Gunong Tahan and the hills surrounding the head of the Teku valley, with a view to the planning of a hill station or sanatorium, was also undertaken and completed. The field work of the detail survey of Kuala Lumpur was completed.

The progress of the Revenue Survey was normal, the total acreage and chainage returned being slightly in excess of that returned for 1912. The demand for land seems to remain about the same, the returns showing only a slight total decrease in the number of approved applications for agricultural land. As regards the number of requisitions remaining on the books at the end of the year, the position is practically unchanged, except that there is a small increase in the number of native holdings awaiting survey or completion of titles and a large increase in area of forest reserves to be dealt with.

The map of the Anglo-Siamese boundary was completed and printed and delivered with the Commissioners' report to their respective Governments.

The Central Drawing Office and Photo-Litho. Section were kept fully occupied throughout the year, the detail map of Kuala Lumpur, which is now being published, adding a good deal to their labours. The usefulness of the Instrument-Repairing Section was checked by the resignation of the Chief Instrument Repairer and the invaliding of his assistant. Neither was replaced during the year under report.

The Technical School passed out 26 Probationers for the department—mostly for the Revenue Survey Branch.

EXPENDITURE, REVENUE AND COST OF DEPARTMENT.

2. The increase in expenditure compared with the preceding year is due chiefly to increased expenditure on account of mapping and publication and on the Colonial Survey Section, but also to increased expenditure in all the Revenue Survey Establishments with the exception of the Perak Establishment—due principally to the filling up of vacant appointments.

There is unfortunately also a total decrease in revenue on survey fees, etc. Although the Selangor and Pahang Establishments show increases in survey fees collected, the decreases in comparison with the preceding year in Perak and Negri Sembilan largely outweigh these. The chief reason for this decrease in revenue, supposing the normal proportion of survey fees due to have been collected and returned, appears to be the diminution of remunerative work—*viz.*, in Perak fewer large estates, and in Negri Sembilan more small native holdings and a large area of forest reserves.

Thus there is a considerable increase in the net cost of the department—*viz.*, from \$778,265 to \$900,769. The gross cost of the Revenue Survey Branch was \$849,150, from which \$258,652 recovered in revenue must be deducted, giving the net cost of the Revenue Surveys as \$590,459 and the percentage of expenditure recovered 30 per cent.

SUMMARY OF PROGRESS AND COST OF THE SEVERAL BRANCHES.

TRIGONOMETRICAL BRANCH.

3. The Trigonometrical Branch being again very shorthanded during 1913, the work carried out was necessarily limited. The observations from 15 stations of the Kelantan triangulation were, however, completed. The whole of this work will, it is hoped, be finished in 1914. Parts of the country traversed on this work are amongst the wildest in the Peninsula. On the long and difficult ascent to G. Noring on the main watershed the survey party saw no signs of man for seven days. The important traverse and triangulation along the Pahang river for the control of the surveys of the numerous settlements along this great waterway was considerably advanced, leaving only 33 miles yet to be dealt with. The traverse, commenced in December, 1912, along the rugged watershed of the main range between Selangor and Pahang was continued and the part most important for the control of the mining surveys on either side completed. The precise levelling was carried on continuously during the year, 245 ordinary bench marks and 25 permanent marks being emplaced. Minor triangulation of secondary value—*i.e.*, sufficiently rigorous for the control of the land surveys, was commenced in the district of Upper Perak for the more immediate purpose of supplying points for the control of the topographical survey to be extended into this part of the country in 1914; and the traverse along the Perak river was continued for about 37 miles, and for the same purposes. Base lines to ensure the preservation of the scale of measurement were selected and prepared in Kelantan, for the Kelantan triangulation more particularly, and in Kedah for the proposed revision of the principal triangles of the main triangulation of the Peninsula.

The computation of tidal data at Port Swettenham from the records of the automatic tide gauge was carried on. The loss of our Instrument Repairer prevented the installation of the other automatic gauge at Port Dickson; but the staging for this purpose was erected. The cost of ordinary traverses remained about the same. The cost of that along the Selangor-Pahang watershed was very high on account of its position, the nature of the country and labour difficulties.

TOPOGRAPHICAL BRANCH.

The normal progress of the one inch to the mile topographical survey suffered considerably from lack of supervision during 1913, owing to the absence on leave of the Superintendent and the employment of the Acting Superintendent on special work during five months of the year. With the exception, however, of about 20 square miles of detail and some final examination on the ground, the proposed programme was carried out. This comprised two standard sheets, one containing part of the Plus valley and the other part of the Perak valley—in all about 595 square miles. The cost of the work in the former sheet, which includes some difficult hilly country, is about \$71, including all charges; and of the latter, which contains mostly easier country though partly very swampy, about \$56 per square mile. The average cost of the field work during 1913 comes to about \$57.8 per square mile, including supervision and all field expenses. This shows a considerable reduction on previous rates, and indicates satisfactory increase in efficiency of the field hands.

As mentioned above in the General Abstract a special survey was undertaken with a view to obtain a basis for the planning of the proposed sanatorium or hill station of "Gunong Tahan." The area surveyed comprises the hill itself and the upper parts of its two main spurs, Larong and Gedong, enclosing the headwaters of the Teku river. On Tahan and on these spurs, broad above, then falling steeply to the gorge of the Teku, there are certain limited areas, comparatively flat or gently undulating, which are suitable for building sites. These were completely surveyed and contoured on large scales. The remainder of the area was surveyed on smaller scales in order to obtain a complete map sufficient for the planning of communications, drainage and water supply. The total area thus dealt with was 14.3 miles. A complete meteorological record was kept up and several streams gauged for estimation of water supply. Owing to the difficulty of communications and therefore of supply and, during part of the time, to bad weather, this work occupied longer than was anticipated, and was attended by considerable hardship. The Malay assistants, especially, suffered from the cold and from lack of variety of diet. During the work the communications of the party were entirely by the old route down the rocky ridge on the left of the Teku to the junction of that river with the Tahan and thence by the Tahan, a difficult and unreliable line. Just on the completion of the work, however, communication was established by the Kechau valley route leading over the Larong spur on the other (right) side of the upper Teku, a comparatively easy and a safe route; so that in future any preliminary development will not be similarly jeopardized. A complete account of this survey is included in this report. Other special topographical work carried out was the continuation of the detail survey of Kuala Lumpur town on the scale of one chain to the inch. The field work of this was practically completed, excepting for the examination of some parts of it, by the end of the year.

COLONIAL SURVEY SECTION.

This survey section consisting of two officers and four non-commissioned officers of the Royal Engineers continued the topographical work in Negri Sembilan. In September the strength of the Section was increased by the addition of two more non-commissioned officers, thus effecting a more economical proportion between the detail topographers and the officers in charge of the preparation of the necessary framework of control and of the final examination of the work. During the year one full sheet was completed and another, containing a strip of coast about Port Dickson, was finished all but the final examination. Work was carried on also in parts of three other sheets which will be finished probably during the first half of 1914. In all, 472 miles of detail were completed during the year under report. Progress was considerably impeded by rain, by occasional sickness and by parts of the country under survey being flooded at times. The cost of the detail work alone, excluding the officers' parties which were chiefly engaged in clearing and fixing points ahead for the extension of the detail, was about \$55 per square mile. When the addition of the two extra Topographers begins to make itself felt this cost should be found to have been somewhat reduced. The average rate per man per working day was 0.51 square mile. As indicating the difficulty of anything like rapid progress in topographical work in a wet uncertain climate without any regular seasons it may be noted that the average number of full working days in each month is about 17, allowing for a fortnight's leave during the year, public holidays and Sundays. The remainder of the time is lost by rain, sickness, moving camps and delays generally due to difficulties with coolies.

REVENUE SURVEY BRANCH.

The progress of the land surveys during 1913 may be considered as fairly satisfactory. In all, 270,375 acres (about 422 square miles) were surveyed for registration of title, in some form, or for reserve to the State. This is about 5,500 acres more than last year. There is an increase also in the return of total chainage from 642,001 to 663,958. The average cost per acre and of chainage have both, however, also slightly increased. The increase in cost per acre is due to the fact that a lesser number of large rubber estates and forest reserves and a much greater number of small portions were surveyed in the year under report compared with the preceding year, this difference being particularly marked in Perak. The slight increase in the cost of chainage is probably due to increase in transport and labour expenses on mining surveys on the high lands of the Raub and Bentong districts and to the difficulties of work amongst the limestone cliffs of Kinta, where a good deal was done during 1913. The average cost per acre in 1913 was \$1.72; in 1912, \$0.64. The average cost per chain in 1913 was \$0.70; in 1912, \$0.64.

As indicated above, there has been a diminution in the demand for extensive areas for rubber plantation during the year. The number and average area of mining lots applied for appear to be about the same as in the preceding year. There is a great increase in the number of requisitions received for native holdings. Some large tracts of country gazetted as forest reserves are recorded as for survey in 1913, but have not been completely dealt with.

As regards surveys still on the books of the department at the end of the year: those for agricultural purposes have been considerably reduced both in area and in number. There is a small increase however in the arrears of surveys of mining lots and of native holdings. There is a very large increase in the area of forest reserves to be dealt with. Except for the last-mentioned item, which is not important from the point of view of urgency, the department is much in the same position as last year. All old outstanding arrears that can be dealt with at all have now been practically wiped off, though still much revisionary work remains to be done in Negri Sembilan, the legacy of unscientific methods in the past. There was a slight general increase in the effective strength of nearly all grades in the Revenue Survey Branch during 1913.

HEAD-QUARTERS BRANCH AND DIVISIONAL REPORTS.

HEAD-QUARTERS, SURVEYOR-GENERAL'S OFFICE.

4. In January the Surveyor-General visited the Topographical and Revenue Survey Offices in Taiping and the Revenue Survey Offices in Batu Gajah and Kuala Kubu. The Topographers of the Colonial Survey Section were inspected in the field by the Surveyor-General in March, in which month he also again visited the Topographical Office in Taiping.

Major G. S. Knox, R.E., arrived on the 23rd May to take up his appointment as Assistant Surveyor-General.

In June the Surveyor-General inspected the field parties of the Topographical Branch on the ground in the Upper Perak and Kuala Kangsar districts and also the Revenue Survey Offices at Taiping, Batu Gajah, Telok Anson and Tapah. In August the Revenue Survey Office at Seremban and the Colonial Survey Section head-quarters were visited.

In September the Surveyor-General inspected the Revenue Survey Offices at Kuala Kubu, Raub and Kuala Lipis, and the Topographical Section under Mr. Sheffield on G. Tahan, whence descending the Pahang river he inspected the revenue survey work at Temerloh, Pekan and Kuantan, returning to head-quarters in October, a tour occupying about five weeks. The Topographical and Revenue Survey Offices at Taiping and the Revenue Survey Offices at Kuala Kangsar and Batu Gajah were again visited in December, in which month also the Surveyor-General made another inspection of several of the topographers of the Colonial Survey Section in the field in Negri Sembilan.

SURVEY CLASS—TECHNICAL SCHOOL.

The numbers of Survey Probationers entered, discharged and passed out during 1913 were as follows:

	Indians.	Malays.	Chinese.	Totals.
Remaining in class on 1st January, 1913. ...	9	3	...	12
Admitted during 1913.	27	12	...	39
Passed out into Survey Dept. in July, 1913.	20	6	...	26
Discharged during 1913.	2	2	...	4
Died	1	...	...	1
Remaining in class at end of year	13	7	...	20

The supply of suitable candidates is still insufficient. There are few applicants from local schools. Excluding Malays, out of 27 admitted during 1913, only two had been educated in the Federated Malay States or Straits Settlements. No Chinese applied for admission during the year under report; but more Malays applied and were admitted than previously. It would appear that Malay boys do not stay long enough at the elementary schools. The general excuse is poverty. Out of 16 Malay candidates in 1913, only three had passed the seventh standard and three the sixth standard. The others had not reached further than the fourth. It is difficult to take up the technical education of lads thus poorly provided.

CENTRAL DRAWING OFFICE.

Mr. W. F. S. Breymann, formerly of the Transvaal Survey Department, took up the duties of Chief Draftsman in February. This enabled the work to be carried out more systematically than in the preceding year; but owing to the lack of expert senior Draftsmen the Surveyor-General had still to attend to much of the mapping, etc., himself. The preparation of the sheets of the Kuala Lumpur town survey threw a great deal of extra work on the office; so that the publication of the topographical sheets of the general one-inch series was unduly delayed. Nine of these sheets however were dealt with. Sheets $2\frac{I}{14}$, $2\frac{I}{15}$, $2\frac{M}{2}$ and $2\frac{M}{3}$ were completed for photo reduction. These contain the whole of the Krian district and parts of Larut and Selama. Four other Perak sheets were well advanced—viz., $2\frac{M}{4}$ (Larut and Kuala Kangsar districts), drawing completed and typing nearly completed; $2\frac{M}{8}$ (mostly Kuala Kangsar district), drawing of outline completed, hill sheet in hand; $2\frac{I}{16}$ (parts of Larut, Upper Perak and Kuala Kangsar districts), drawing of hills completed, outline sheet in hand; $2\frac{I}{11}$ (mostly Kedah—a small portion of Selama district only), drawing completed. The Negri Sembilan sheet of the Colonial Survey Section $3\frac{F}{8}$ (parts of the Coast and Seremban districts) was commenced, the outline drawing being still in hand at the end of the year.

The Kuala Lumpur town map consists of 79 large sheets. The field sheets to the number of 147 were penned in and typed in the Central Drawing Office, and 79 tracings prepared for direct photo-reproduction. In addition, 28 sheets were traced on cloth for the immediate use of the Sanitary Board. It was proposed originally to print the property boundaries in colour over the detail; but, owing to the difficulty of assuring the lines appearing in the exactly correct relative position on the prints, it was thought better to abandon this idea. Tracings of the property boundaries on each sheet—i.e., the boundary lines as surveyed and recorded on the revenue survey plans and the titles, have however been prepared; so that it is always possible to supply this information in any particular case without delay.

Other work carried out during the year included the preparation for direct photo-reproduction of 18 sheets of the Kinta district (revenue survey plans) on the scale of 16 chains to the inch, the preparation of a general map of the Federated and Protected Malay States with the Straits Settlements on the scale of 8 miles to the inch for photo-reduction to 12 miles to the inch, a sketch map of Perlis from one of the sections of the Anglo-Siamese boundary survey, and maps of Serendah town and of the Lake Gardens (Kuala Lumpur).

The preparation of tracings for the production of sheets comprising the Ulu Selangor district was also undertaken, and well advanced. The object of these maps was to meet the demand of the District Officer and of the mining public and to replace some of the old manuscript ten-chain sheets in the Selangor Revenue Survey Office, which have become much worn and dilapidated from long handling. The publication of these sheets—*viz.*, 140 "Quarter" sheets, should be completed early in 1914.

Miscellaneous work included the preparation of progress index maps and charts for the annual reports of the Surveyor-General and the Senior Warden of Mines, and the preparation of various maps, plates, charts, notices, diagrams, etc., for the Railway, Public Works, Forests, Medical, Health, Agricultural, Labour and Police Departments and the Sanitary Board. Small special maps were also prepared for the British Resident, Pahang, and the Advisers to the Johore and to the Kedah Governments; and a chart of prices of tin for the Selangor Chamber of Commerce.

The Draftsmen generally have made good progress, and some of the younger ones promise well. The death of Chong Kim Ewe who was in charge of the map typing, etc. was a great loss to the office.

PHOTO-LITHOGRAPHIC SECTION.

The out-turn of the Photo-Lithographic Section during 1913 shows a satisfactory increase in quantity over preceding years as well as an improvement in quality. The principal maps printed were as follows: map of the Anglo-Siamese boundary commission, three of the sheets of the one inch to the mile topographical series—containing the Dindings territory and parts of Perak, a map of Perak on the side of two miles to the inch in eight sheets (in colours), a map of Pahang on the scale of four miles to the inch in six sheets (in colours), sketch maps of Kedah and of Perlis, maps for the annual report of the Adviser to the Kedah Government, revised railway poster and time-table maps (in several colours), a topographical map (in colours) of Seremban and environs from the work of the Colonial Survey Section, a large war game map for the Malay States Volunteer Rifles, 12 sheets of Ipoh town, 14 sheets of Kinta Revenue Surveys on the 16-chain to the inch scale, Serendah town, progress index maps for the Surveyor-General's annual report and for that of the Senior Warden of Mines, the remainder of the printings of the Malaria poster—*viz.*, 20,000 in Tamil and a reserve stock of 18,000. In addition, a number of maps, plans and illustrations were printed for the Railway, Medical, Forest and other Departments and some notices in different scripts for the Labour Department.

The total number of impressions was 126,272. The Photo. Section turned out 170 negatives; and the Helio Section, 260 Helio-Zinco and "Vandyke" plates. The apprentices in the two last-mentioned Sections have become much more expert and reliable and can now be trusted to do very fair work with good negatives or originals.

Great difficulty, however, is experienced in obtaining suitable lads for training in map-reproduction work, those presenting themselves for employment being generally deficient in education and intelligence. The development of the Technical School, in such a way as to provide for instruction by evening classes in these ("lithographic") as well as in other trades, would probably produce a good effect in this respect and enable Malays, who as a race seem to have a natural aptitude and liking for mechanical processes, to command a larger field of employment and one in which they would not have to compete to such disadvantage with natives of India and with the Chinese.

The financial position of the Photo-Litho. Section may be roughly set out as under (without taking into account either value or depreciation of plant or of materials in hand):

Amount paid on salaries and wages (including map mounting, etc.)	\$11,376
Cost of materials used	1,105
" electric current	604
Total cost of work	\$13,085
Recovered from other departments and paid into Treasury	} Maps \$1,039
Received from the public and paid into Treasury	} Special work 1,613
	} Maps 1,179
	} Special work 82
Total	\$3,913
Outstanding accounts, other Government departments	\$ 517
* Maps supplied free to other Government departments	621
Departmental work, cost of, plus 25 per cent.	1,142
† Value of maps in stock at end of year	} Less 5 per cent. ... 23,532
Total credits	\$29,725

* Calculated at sale price as published in *Government Gazette*.

† Calculated at sale price of maps when published, but subject to depreciation on maps becoming obsolete, or withdrawn for revision. (Five per cent. deducted for year of printing.)

The personnel of the Photo-Litho. Section in 1913 was nearly the same as last year. Mr. T. R. Black, Superintendent in general charge, Mr. W. D. Mavor, Foreman Lithographic Printer, A. R. Ahmad, Lithographic Draftsman, and about 20 apprentices in the several sub-sections.

INSTRUMENT-REPAIRING SECTION.

Owing to the resignation of the Chief Instrument Repairer at the end of his three years' agreement and the invaliding of his European assistant shortly after arrival, this Section was unable to deal with any but minor repairs during the year. By the personal attention, however, of the Assistant Surveyor-General, Major Knox, the workmen were kept usefully employed on such repairs as did not require expert knowledge, and in making some small articles of apparatus for departmental use.

TRIGONOMETRICAL BRANCH.

5. Mr. V. A. Lowinger, Superintendent, Trigonometrical Branch, left on 'ten months' leave in April, 1913. In his absence Major G. S. Knox, R.E., Assistant Surveyor-General, has officiated as Superintendent since his arrival in May.

The output of the Branch has been comparatively small; for out of a field staff establishment of 12 Europeans there have been three vacancies for the whole year; and out of a computing and drafting staff of 14 there have been four vacancies for six months and three vacancies for 12 months.

The principal work done was as follows:

(a) Triangulation of part of Kelantan by Mr. Cochrane. Had it not been for an outbreak of small-pox in this State (which caused the death of our best Mandor, Hitam bin Pawang Gendut, and several coolies), and for bad weather in the latter part of the year, the major triangulation of the whole State would probably have been almost completed. Observations were taken from 15 stations.

The work in Kelantan was attended by other difficulties than those caused by small-pox (six weeks quarantine and six deaths), and bad weather. Mr. Cochrane writes: "The country west of the Pergau and Galas rivers is, I think, the wildest I have been through. There are not even Sakais in the neighbourhood of Gunong Noring, though there are several further north round Tomoh. On the Noring trip we walked for seven days without meeting any signs of people—that is, from Kuala Bala to Noring. The country is here very steep and difficult; dense thickets of rotan and bamboo have to be cut through.

Near Kuala Bala, Mr. Cochrane was told of a "mine" somewhere in the neighbourhood to which a party of Malays goes about once a year and brings back gold dust. The exact locality could not, however, be ascertained. This part of the Peninsula seems to be particularly subject to bad weather. Mr. Cochrane writes: "Even in the dry season Kelantan appears to suffer from violent storms—at any rate on the hill tops. On two occasions my camp was blown completely down during the night; and, as the wind continued blowing violently for some hours afterwards, it was impossible to re-erect the tents; so we sat patiently in the rain till morning."

The north-east monsoon finally stopped the work for the year in October after Mr. Cochrane had vainly for some time tried to complete the observations from Bt. Beranget on the Trengganu border. Near here a very wild lot of Sakais were seen, who ran away at the sight of the survey party, and would not let themselves be approached. They are described by Mr. Cochrane as "black Sakais with thin features and woolly hair, wearing porcupine quills stuck through their noses." No cultivation was seen.

(b) Continuation of the main traverse by Mr. Goulding of the Pahang river from P. Lebok to Kam Bukit Sanding—about 4,912 chains on both banks.

Mr. Goulding went on leave in September; and it was impossible to continue the work owing to the weakness of the field staff.

(c) Precise traverse by Mr. Simpson along the precipitous jungle-covered watershed of the Selangor-Pahang boundary between the Semangko Pass and G. Ulu Kali. About 1,751 chains were completed during 1913.

This, though necessary for defining the inter-State boundary and furnishing a line of rigorous control for the land surveys, owing to the development of tin mining on either side of the watershed, is proving abnormally expensive on account of the nature of the country and the impossibility of inducing the labourers to stay for any length of time on the work.

(d) Precise levelling by Messrs. Edwardes and Durst between the following places :

Slim river to Tapah Road along railway ;
 Tapah Road to Telok Anson along railway ;
 „ Taiping along railway ;
 Taiping to Simpang along railway ;
 „ Parit Buntar along railway ;
 Batu Junction to Batu Caves along railway ;
 Sentul to Batu Caves along road ;
 Batu Caves to Tranum along road ;
 Tranum to Kuala Kubu along road ;
 „ Benta along road ;
 Benta to Kuala Lipis along road ;
 „ Jerantut along road.

One complete circuit has been closed with an error of .093 feet in 141.8 miles. (See also para. 3.)

(e) Computation of data for predicting tides at Port Swettenham from the records of the automatic tide gauge.

(f) Minor triangulation and traverses by Messrs. Twamley and Abraham in Upper Perak for the control of the topographical work to be undertaken in this country during 1914.

The triangulation was carried out entirely by Mr. Twamley. Mr. Abraham of the Topographical Branch was employed on a traverse up the Perak river. Whilst so employed he was attached to the Trigonometrical Branch for instructions and payment.

(Results.)

Comparative statement of computations reduced and filed :

	1913.	1912.
Angle sheets, sets of	27	36
Traverse field books	24	26
Geodetic levelling field books	153	34

Triangles completely observed :

	1913.		1912.		Average triangular error.	
	1913.	1912.	1913.	1912.	1913.	1912.
Major	17	21	11	2.29		
Minor	8	6	2.64*	3.27		

Beacons erected :

	1913.	1912.
Major	4 (in Kelantan)	45
Minor	32 (in Upper Perak and Pahang)	0

Standard traverses computed :

	1913.	1912.
Chains	27,366	18,006
Marks fixed	1,808	1,280
Average closing error on trigonometrical distances	$\frac{1}{33800}$	$\frac{1}{22600}$

Precise levelling :

Miles levelled	371
Permanent bench marks fixed	25
Ordinary „ „	245

Number of positions supplied to revenue survey :

Major trigonometrical points	Nil	7
Minor „ „	11	22
Permanent traverse marks	1,808	1,415
Temporary traverse marks	278	251
Approximate positions	1	nil
Approximate positions supplied to Topo. Survey	33	„

* Owing to the observations not having been completed, none of the Kelantan work has yet been computed.

FINANCIAL.

		1913.		1912.	
6.	Provided in Estimates	...	\$175,107	...	\$194,537
	Spent by Trigonometrical Branch	...	108,475	...	125,435
	Transferred to other Branches	...	8,881	...	19,554
	Unexpended	...	58,315	...	49,548

The saving was due to shortage of staff. The item "spent by the Trigonometrical Branch" includes the following which is not strictly chargeable to trigonometrical work:

Salary of Surveyor lent to Revenue Surveys (Selangor) \$5,486.

		1913.		1912.	
	Expenditure on instruments and non-consumable material	...	\$2,108	...	\$3,441
	Liabilities	...	886	...	—

(Revenue.)

The Trigonometrical Branch no longer collects a regular revenue; but during the year \$360.42 were received from the Johore Government to complete the refund for trigonometrical work carried out for that State.

FIELD COST.

7. The average field cost per beacon erected was \$840. The cost of standard traverse works out at \$125.51 per mile for the whole year. But this high figure is due to the abnormal expense of the Selangor-Pahang watershed traverse, the rates for the other traverses being normal. The cost of precise levelling was \$39.92 per mile.

TOPOGRAPHICAL BRANCH.

8. The Topographical Branch was severely handicapped during 1913 by the absence of the Superintendent, Mr. Hedgeland, on long leave from April to the end of the year and by the employment of the Assistant Superintendent (Mr. Sheffield) on the special survey of G. Tahan from the end of April to nearly the end of October. During the latter period the Superintendent, Revenue Surveys, Perak (Mr. Harper), took charge of the Topographical Head-quarters Office at Taiping and saw to the payment of the field parties, issue of stores, etc. The Surveyor-General visited nearly all the field parties on the ground during the months of June and July. The immediate supervision of these field parties was in the hands of Mr. Perfect, Second Grade Surveyor, and Mr. Chanmugam, Second Grade Assistant Surveyor. Mr. Abraham (Second Grade Surveyor) was employed in the preparation for topographical work in Upper Perak most of the field season, until November, when he assisted in the checking of the work on the sheet of which Mr. Perfect had been in charge. Mr. C. S. Wood was re-transferred to the Topographical from the Revenue Survey Branch at the end of April, and accompanied Mr. Sheffield to G. Tahan, more especially for meteorological work. On his return he assisted in the completion of the topography of one of the Perak sheets.

DETAILS OF WORK, 1913.

Of the two standard sheets undertaken in Perak in 1913— $2\frac{M}{12}$ and $2\frac{N}{1}$, the former was completed with the exception of part of the final examination and the latter with the exception of about 20 square miles of detail and the final examination.

Sheet $2\frac{M}{12}$ consists partly of undulating, partly of flat country, with a good deal of swamp and jungle, some mining land and a strip of kampongs along the Perak river. Work in the swamps resulted in the usual sores on the legs; but there was little fever amongst this party. A herd of elephants in the Blanja Forest Reserve seems to have caused one of the young Surveyors some anxiety. The cost of this sheet was comparatively low, owing partly to few incidental expenses, partly to the lower salaries of those employed on it. The net field cost without the cost of supervision was \$30.87 per square mile. The proper gross field cost, including supervision and all field expenses, works out at \$45.68 per square mile. This is about as low as is economically possible.

Sheet $2\frac{N}{1}$, containing part of the Plus valley, consists mostly of fairly difficult country, about 170 square miles being forest-covered hills running up to 4,500 feet in height. The remainder is mostly undulating forest land with about 31 square miles of rubber plantation and kampong land. The net field cost of the area surveyed without the cost of supervision was about \$41 per square mile. The proper gross field cost, including supervision and all field expenses up to the end of the year and estimating proportionally for the completion of the sheet, will be \$71.23 per square mile, approximately. This party suffered a good deal from fever and from difficulties caused by heavy rains. The Plus valley elephants also hindered the work by preventing the Surveyor employed in the northern part of the sheet from camping on his work on several occasions when this would have expedited his progress.

The other field work carried out in 1913 consisted of a traverse up the Perak river from Janing to Kuala Ringat, chiefly for topographical control, the completion of the field work of the large scale topographical survey of Kuala Lumpur town referred to in last year's report, and the survey of G. Tahan, as to which the report of Mr. Sheffield, who was in entire charge of this work, is attached (*vide* para. 9).

An expenditure of \$1,494 was incurred in supplementary and revisionary work, consisting chiefly in bringing up to date work that had been long in hand owing to the delay in publication of the first topographical sheets undertaken. This liability has been greatly reduced from last year and should no longer be at all considerable, provided regular progress of publication is maintained.

TRAINING OF ASIATIC TOPOGRAPHERS.

At the beginning of 1913, ten probationers were attached to the field parties. Of these, five were Jaffna Tamils, two Chinese, two natives of Northern India and one Malay. The relatively small number of Malays on this list is due to the fact that most of this batch were passed into the Topographical Branch from the Technical School, where comparatively few Malays enter and these generally not of the right type for topographical work. It is hoped that more Malays may be obtained next year. But, although a few of the Malays we have trained have done remarkably well, it seems doubtful whether they will be able to stand the hardship of topographical work for a number of years. Three Malay Assistant Surveyors attached to the G. Tahan survey completely succumbed to the change in conditions of life at a comparatively high altitude, although they showed praiseworthy resolution in working as long as they possibly could.

OFFICE WORK.

The small office staff was employed in preparing the plane tables and supplying occasional tracings of work in hand to those requiring them.

The Ipoh town survey will be taken up after the next regular field season; and other such surveys will probably enable us during the wetter season to employ the field hands, who are not on leave or employed in the office, on work at an easy distance from head-quarters and unattended by hardship or privation.

REPORT ON THE SURVEY OF G. TAHAN.

9. The survey party detailed for this work consisted of Mr. J. N. Sheffield, Assistant Superintendent, Topographical Branch, in charge, Mr. C. S. Wood, Surveyor Probationer, A. Sanmugam, Assistant Surveyor, Second Grade, and Fourth Grade Assistant Surveyors Mohamed Ariffin bin Daud, Mohamed Yasin bin Khatib Senor and Mahmud bin Nakhoda Mat Kassim, with two First Class Mandors, a Storekeeper, one apprentice, and 25 survey coolies. The number of the last mentioned varied from time to time. The boatmen and porters who brought the total number of persons up to 120 were recruited by the orders of the British Resident through Pangklina Kakap, Penghulu of the Ulu Tembeling, and included two men most valuable for their experience of this route—Pah Nik and Mat Aris. The rapids of the Tahan were negotiated without any serious loss or damage and the whole party had reached the main camp on the hill, known as the Padang Camp, by the end of May. The assembling of the party on the scene of its operations occupied a considerable time owing to the difficulties of transport and the necessity of conveying the delicate meteorological instruments with great care. However, work was commenced immediately on arrival. By 1st June the essential preliminary additional trigonometrical fixations had been obtained by Mr. Sheffield, who preceded the others up the hill, thus enabling all the Topographers to take the field by the 8th of the same month. By the 11th all the meteorological instruments had been brought up safely, and, the necessary shelters, etc., having been erected, complete records of rainfall, sunshine, temperature, wind pressure and moisture were begun on the 13th, and carried on continuously until the middle of September, when the observer had to assist to complete the survey work in as short a time as possible.

During May and June the cold and damp and a generally cold north-west wind tried the Surveyors rather severely, but towards the middle of July the weather improved and remained good throughout August.

Progress was somewhat slow up to the end of June owing to the unaccustomed cold and to the fact that the Surveyors were not used to working on the large scales on which some of the areas had to be surveyed. During this time also Mr. Sheffield had to complete the triangulation; and for this, although the total area under survey was not large, some lengthy journeys (as much as $2\frac{1}{2}$ days in one case) had to be made owing to the conformation of the area to be dealt with, traversed as this is by the deep gorge of the Teku and surrounded by steep ridges, the spurs and gullies of which are covered by a particularly thick though generally stunted growth. In July the officer in charge was able to give more personal attention to the Topographers, and about the middle of that month took up some of the detail work himself. Thus throughout July progress was more satisfactory.

In August, however, the trouble began. The Malay Surveyors were the first to succumb to the unusual conditions. Mohd. Ariffin had to be sent down on the 3rd August. He was not in robust health when he came up and had been sick some time before he gave in. Mohd. Yasin was the next to fail, though rather an exceptionally sturdy Malay; and was sent down a few days after the other.

In August, Mr. Sheffield moved across the Teku to one of the other open places now known as "Padang Sebrang," Mr. Wood remaining at "Padang Camp" to keep up the meteorological record.

Towards the end of August the remaining Malay Surveyor, Mahmud, who had been ill for some time, had to stop work and was sent down, and about the same time Mr. Sheffield's Chinese cook had to be sent away, and died on his way down. Another fatal case, one of the Taiping Malay coolies, occurred the following day in similar circumstances. Up to this time, the end of August, there had been ten cases of this disease which has since been diagnosed from cases brought to hospital at Lipis and Taiping as beri-beri.

Another fatal case occurred early in September, a Tembeling Malay dying on his way down.

Thus about this time, mid September, things were not looking very bright for the survey party; three Topographers had been invalided; the survey coolies were continuously deserting or dropping out on account of the disease above described or on account of "kudis," which had appeared amongst them in a very virulent form; and provisions were running short owing to the unexpected extension of the party's stay on the hill due to these misfortunes. The weather, moreover, had broken again, with clouds and mist and driving rain at night. And shortly another misfortune befell in the sickness of the only remaining Assistant Surveyor, and Mr. Sheffield's mainstay in the work, A. Sanmugam, who, after struggling against an attack of a kind of fever for five days, had to be sent down.

Owing to the loss of all his Surveyors, Mr. Sheffield was now obliged to take Mr. Wood off the meteorological work and get his assistance in completing the detail survey.

On the 24th September, the Surveyor-General accompanied by Mr. E. L. Bennett, Acting State Engineer, Pahang, and Mr. Barrowcliff of the Agricultural Department, arrived at the Padang Sebrang Camp, having come up the new Public Works Department trace to the foot of a long spur of "Larong" or "G. Ulu Kechau" and then up the ridge of that spur. The Surveyor-General inspected the work, visited the top of G. Tahan and the Padang Camp and left by the old route after spending three days on the hill. On arriving at the Depôt Camp at Kuala Tekku at the junction of the Tahan and Teku rivers it was found that the boats that should have arrived to take the party down and bring up provisions for the survey had not been able to get up. After a wait of two days, there being hardly a day's rice left for the men, it was decided to cut a way down the left bank of the Tahan in the hope of meeting the boats. The sick men at the depôt who could not walk were taken along in two boats found at that place. Before leaving, a messenger was sent up to advise Mr. Sheffield of the state of affairs and instructing him to get in touch with the Public Works Department contractor on the road trace on the other side. Some of the boats were met the second day just in time. Those, with such supplies as were not necessary to enable the Surveyor-General's party to get out, were hurried up to the relief of the survey party. These supplies reached Mr. Sheffield none too soon, he and his men having been on very short rations for some days, and even reduced to an attempt to add to their larder by shooting some very small birds of the fly-catcher species that frequent the bushes round the Padang Camp.

The last relief arrived on 4th October. Mr. Sheffield had meantime by dint of great exertions managed to complete the work on the third open space surveyed on one of the larger scales—the "Padang Luas," lower down on the right of the Teku; but he had still about a week's work left to complete the sketching in of some of the rough steep slopes on the small scale portion.

On 10th October the Mandor arrived by the Tahan route with coolies for the return journey. Whilst Mr. Sheffield was completing the small scale portion, the meteorological observatory was dismantled and Mr. Wood with some of the men left by the old route.

On the 16th some men arrived from the other (the Kechau valley) side, and the weather having fortunately permitted the completion of the work, Mr. Sheffield left on the 18th by that route (having been exactly five months on the hill), reaching Lipis on the 22nd of October. The opening up of the new route thus just saved the situation, for supplies were by this time again nearly exhausted, owing chiefly to the dishonesty of a few of the coolies.

The total area surveyed was 14.3 square miles. Of this 1.5 square miles is on the scale of 10 inches to the mile, 0.6 square mile on the scale of 2 chains to the inch (*i.e.*, the two most promising building sites); and the remainder, consisting of rough broken slopes, steep and often precipitous, intersected by numerous watercourses and covered generally with dense jungle, on the scale of 4 inches to the mile.

The most noticeable phenomenon during the stay of the survey party on the hill was the prevalence of a strong and generally cold wind from the north-west. On the exposed ridges this wind was so cold during June that some of the Asiatic Surveyors could not carry on their work. Temperatures generally varied locally according to exposure to or shelter from this wind and duration of exposure to sunshine. Thus Padang Sebrang (4,906 feet), a little more sheltered than "The Padang," was certainly generally warmer; and "Padang Luas," 4,650 feet, was a comparatively comfortable place to camp in, according to Mr. Sheffield. On the other hand the temperatures in the Padang Camp, 200 feet below "The Padang," were generally lower, owing probably to the last-mentioned place being more affected by direct sunshine.

HEALTH OF SURVEY PARTY WHILST ON THE HILL.

As already indicated in the general account of the work, the Malay Surveyors and labourers suffered a good deal from a disease that, in some cases brought down and handed over to the Medical Officers, has been diagnosed as beri-beri and in most cases resembled that disease in its effects. The symptoms were apparently generally the same or very similar. In all 22 cases are recorded, of 19 of which Mr. Sheffield has kept records of the sequence of the symptoms. These records have been handed to the Institute for Medical Research.

That the climate of the hill is not in itself other than very healthy is shown by the fact that the two Europeans were perfectly well the whole time, in spite, particularly in Mr. Sheffield's case, of very hard work, exposure and indifferent food.

The other disease with which the party was troubled was apparently a contagious form of "kudis," aggravated by the fact that the men on account of the coldness of the water did not wash sufficiently. The general condition of the skin in the colder climate probably also rendered it more susceptible to injury. Whatever the cause, the prevalence of this disease in an exceptionally bad form at one time seriously delayed the work in spite of Mr. Sheffield's careful treatment of those affected.

GENERAL IMPRESSIONS OF THE LOCALITY AS TO ITS SUITABILITY FOR A HILL STATION.

The experiences of the survey party may induce a somewhat unfavourable impression of the climate and general conditions of life on G. Tahan. But the sickness and discomfort from which the survey party suffered were due entirely to conditions attaching to a party under canvas in a climate to which the Malays were not accustomed and dependent on a very difficult line of communication for food supply. During the time the party was on the hill the mandor in charge of supplies, Abu Bakar, had to make no less than ten journeys up and down to keep the party in food. Even without regard to the proposed future railway connection, the opening of the track leading from the other side of "the hill" into the Kechau valley will obviate any such difficulties in the future. And the comparative cold, that affected the survey party so unfavourably under canvas and temporary shelters, is the very condition to be sought in the selection of a hill station in the tropics. The extent of open ground, rocky or covered with low scrub and in several places sufficiently flat for building sites, etc., presents, moreover, advantages possessed by no other high ground in the Peninsula. Development will doubtless be slow, expensive and attended with considerable difficulties, but should in the end repay cost and labour by providing in the centre of the country a place where the energy of the European, deteriorating under the influences of a tropical climate, may to a certain extent be temporarily restored. The open aspect of the main hill and of the little spur flats overlooking the Teku gorge, the heath like appearance of these more open spaces, to which in places the outcrops of white crystalline sandstone lend an almost Alpine appearance, the little stunted fir trees and the flora peculiar to these higher regions, rhododendron, pitcher plants and ground orchids of many colours, combine to present a refreshing change to those accustomed to the too luxuriant jungle of the lower lands. The forest in the intersecting valley is indeed high and vigorous, and in the side stream valleys and up the steeper slopes of the two embracing spur ridges, though stunted, is very close and difficult to get through; but this serves as an effective frame or setting to the open spaces; and doubtless a few years' occupation will serve to clear much away for fuel.

Provisional maps of the survey have been printed. The final general map is still in hand.

COLONIAL SURVEY SECTION.

REPORT BY CAPT. T. N. DUNMAN, R.E.

GENERAL.

10. "During the year the four field sheets comprising standard sheet 3 $\frac{F}{8}$ were completed and after examination were sent to Kuala Lumpur for reproduction.

The small standard sheet 3 $\frac{F}{12}$ was also completed; but its final examination was unavoidably delayed until January, 1914. It is hoped that it will be possible to publish this simultaneously with the first-mentioned sheet.

Two Topographers were allotted to standard sheet 3 $\frac{F}{4}$ (which includes a portion of Selangor); two to standard sheet 3 $\frac{G}{5}$ and the small standard sheet 3 $\frac{G}{9}$. By the end of the year an area equivalent to about half these three sheets had been surveyed. No other work will be started in 1914 until these have been completed.

At the end of August, work was stopped and the Section proceeded on leave for a fortnight. This coincided with the end of Bulan Puasa and the Hari Raia Puasa.

At the end of September, Second Corporal G. F. Spice and Lance-Corporal H. J. Chappell arrived in Seremban to join the Section. Camp equipment and instruments had previously been purchased or borrowed and mandors and coolies recruited. As soon as these non-commissioned officers had been equipped, etc., and boards mounted, they were attached to two of the existing parties so as to enable them to pick up a working knowledge of the language and to learn the local conditions. By 1st November they had been moved to Kuala Pilah and started work on the field sheets embracing the area immediately north of that place.

The field parties were inspected by the Surveyor-General, Federated Malay States, during the first week in March and again during the last week in December.

A motor car was authorized for the Section early in the year and this arrived towards the end of April. It has been of the greatest service, enabling, as it does, inspection and examination to be carried out more efficiently and economically, besides generally facilitating the progress of the work.

In October, Lieutenant Hutchison was transferred to Kuala Pilah, as this is more central for the work he has to supervise or carry out himself.

PROGRESS.

The area surveyed during the present year was 472 square miles. Its approximate location is shown on the Topographical Branch progress index map. Rain much delayed progress. It has been an exceptionally wet year (at any rate during working hours). At times in the lower lying country work was impossible even when there was no rain falling, owing to the country being flooded. On the other hand, much of the work has been in very hilly country rising abruptly to over 2,600 feet in places, which is all forest covered. Sickness has also reduced the output. Three non-commissioned officers were in hospital or on sick leave for 35, 23 and 7 days, respectively, besides odd days, while each of the officers was on the sick list for about a fortnight.

The average rate per Topographer per working day was 0.51 square mile, a slight decrease on last year's rate.

COST.

An analysis of the cost of the work is given in appendices A and B, from which it will be seen that the cost per square mile for plane tablers alone is about \$55. Given better weather conditions it should be possible to reduce this considerably, although in the mountainous country now under survey (at the time of writing) the cost must naturally be somewhat high. During one comparatively dry month, when most of the parties were working in average country, the cost was only \$40 per square mile.

If the cost of the officer's parties be included the gross rate works out at just over \$100. A reduction in this high figure can now be safely relied on, partly because of the increase in the number of topographers with the Section and partly because an abnormal amount of hill clearing was undertaken during the last few months of 1913 so as to provide the extra framework required on the field sheets allotted to the two new men. Moreover, in the above cost is included expenditure on hill clearing on sheets which will not be surveyed till 1914. On the other hand, it is intended during the latter portion of the present year to clear hills and observe points on those field sheets which will be surveyed by the two non-commissioned officers after the remainder of the Section has left the Federated Malay States. It is hoped also that some plane table work may be carried out by the officers themselves later on.

PARTICULARS OF WORK.

Lieutenant Hutchison completed the subtense and theodolite traverse work on the coast and the estuary of the Linggi before the end of February. The results were very satisfactory. Thirty-one and a half miles of this class of work were run and also 25 miles of compass work along the narrower rivers.

During the remainder of the year both officers' work consisted in reconnoitring the country ahead of the plane tablers to ascertain where extra trigonometrical points were desirable or necessary; at the same time some more or less rough surveys of paths, rivers or watersheds were also made and place names collected.

Most of the remaining existing trigonometrical stations have been visited, recleared, their signals improved, or, if missing, re-beaconed. Some 40 new topographical trigonometrical stations have been cleared and observed during the period under review. At the end of the year about a dozen more hills were in hand, mostly nearing completion. Rain or clouds and mist frequently interfered with the trigonometrical observation.

This work has been completed on standard sheets $3\frac{F}{12}$, $3\frac{F}{4}$; and a considerable proportion of $3\frac{G}{1}$, $3\frac{G}{5}$ and $3\frac{G}{9}$ has been finished, together with a few points on a portion of $3\frac{G}{2}$.

In addition, portions of the field sheets of standard sheet $3\frac{F}{8}$ were examined in the field. Some revision work was known to be necessary, as new clearings, roads, etc., had been made between the commencement and completion by the topographer of the field sheet.

Plane table boards have been projected and plotted as required and the men's work inspected in the field or in camp from time to time.

In September some time was spent in collecting and issuing stores to the two new non-commissioned officers and in getting them started at work.

The work of the non-commissioned officers has throughout the year been very good. They have all shown themselves to be keen and conscientious. I do not think that a much greater output could be reasonably expected when everything is taken into consideration."

APPENDIX A.

COLONIAL SURVEY SECTION.
ANALYSIS OF EXPENDITURE, 1913.

Head.	Expenditure.	Remarks.
Personal Emoluments (Europeans only)	\$20,402.98	Pay of Corporals Spice and Chappell from 1st November, included
Labour—Survey Coolies	10,762.23	Includes pay of all mandors and also pay of regularly employed coolies when used for moving camp by hand
.. Hill Clearing	6,908.30	\$3,231.80 direct labour; \$3,676.50 contract
Allowances	7,810.00	
Transport Expenses	1,672.39	Includes motor car allowance, etc., and cost of recruiting new coolies
Other Survey Expenses	423.65	Includes cost of fuel, etc., for steam-launch "Idris"
Head-quarter Expenses	1,026.00	Includes rent of bungalow at Seremban, pay of Clerk, etc.
Contingencies—Small Stores	230.35	
Special Expenses—viz., Purchase of Motor Car	1,550.00	
Preliminary Expenses	3,011.14	Includes pay of two non-commissioned officers from date of embarkation to 31st October; cost of sea passages and purchase of equipment and stores for same—also preliminary expenses previous to their starting work on their own field sheets
Total	\$53,797.04	

APPENDIX B.

COLONIAL SURVEY SECTION.

ANALYSIS OF COST OF THE TOPOGRAPHICAL SURVEY.

The total expenditure for the current year may be sub-divided as follows:

A.	B.	C.	D.
\$22,126.12	\$25,864.13	\$2,716.65	\$3,011.14

Column A includes cost of officer's work—*viz.*, cost of administration, supervision, inspection and checking field sheets—together with the reconnaissance, clearing and observing of topographical trigonometrical stations, the reclearing and in some cases beaconing of existing trigonometrical points, and a certain amount of traverse framework.

Column B includes the cost of four plane table parties for the whole year and two additional parties for the months of November and December.

Column C includes head-quarters expenses, purchase of motor car and a few new stores.

Column D. Expenditure incurred in increasing the strength of the Section by two non-commissioned officers up to the time they started work on their own field sheets—*viz.*, 1st November.

Consequently the average cost per square mile of topographical parties only (*column B*) = a little under \$55.

If *column A* be also included, cost = \$101 $\frac{1}{2}$; but this includes the provision of extra trigonometrical stations on field sheets not yet under survey.

REVENUE SURVEY BRANCH.

PERAK DIVISION.

EXPENDITURE AND REVENUE.

11. The expenditure on Revenue Surveys in Perak amounted to \$392,088, which includes \$964 paid on account of a Surveyor employed elsewhere than in Perak. In addition the Clerical Establishment cost \$3,540. The decrease compared with the preceding year and the excess of the estimated over the actual expenditure are due to vacancies and leave. The revenue returned for 1913—*viz.*, \$91,778, is also considerably less than in 1912, though it is in excess of that estimated. The decrease is chiefly attributable to the falling off in applications for large rubber estate surveys. The value of work done for other departments is returned as \$12,427.

OUT-TURN AND COST.

(Field.)

The acreage surveyed in 1913 was less than in 1912, although the number of lots was greater. More native holdings were dealt with in the year under report. There is a considerable increase in the cost per acre of nearly all classes of work and a slight increase in the cost per chain. See appendix C (i).

(Office.)

A large number of documents of title were completed—12,150 in all. This includes 8,459 mukim extracts for native holdings.

A number of the 16 chains to the inch quarter sheets of the land surveys in Kinta were prepared at Batu Gajah, and lithographed partly in Taiping and partly (revised reprints) in Kuala Lumpur at the Central Office. There appears to be always great demand for these. A section of the property boundary survey of Ipoh on the scale of one mile to the inch was also prepared at the Kinta Revenue Survey Office and reproduced in Kuala Lumpur. For details of office work see appendix D.

PROGRESS WITH REFERENCE TO REQUISITIONS.

The total of the various outstanding requisitions for survey remains about the same, the area involved being less. See appendix F (i).

PARTICULARS OF WORK.

The work in the Larut, Krian, Matang and Selama districts was normal and is well up to date. In Upper Perak some progress was made in the survey of scattered native holdings, and near Belum, the remotest village of any importance in the Federated Malay States. In Kuala Kangsar there are still a number of native holdings to be dealt with, somewhat scattered. The surveys of mining leases on and in the limestone outcrops of Kinta have been nearly brought up to date. In Batang Padang there was a slight increase in mining applications. A Chinese towkay was fined \$300 in this district for moving boundary marks. In Lower Perak some large agricultural areas were surveyed and applications for others are coming in. There is a good demand also for smaller holdings in this district.

(Forest Reserves.)

The survey of the Ijok Reserve was in hand and nearly completed as to field work during the year. Drafting of Forest Surveys in Selama, Krian, Kuala Kangsar and Batang Padang was completed and plans supplied to the Forest Department. Some excision work in the mangrove reserves in Krian was also carried out. A number of tracings, etc., were done for the Forest Department.

PERSONNEL.

Mr. J. P. Harper, Superintendent, was in charge the whole year. During the absence of the Deputy Superintendent the Kinta district was in charge of Mr. C. J. Perkins in January and February, and of Mr. E. W. Geyer from February to November, when Mr. L. U. Stafford returned to his post. The Taiping office work was in charge of Mr. J. Bowes the greater part of the year whilst Mr. A. Sugden, Office Assistant Superintendent, was on leave. The Batu Gajah office work was in charge of Mr. J. T. Wood during the whole year. Assistant Superintendents (District Surveyors), Messrs. E. G. Wood, until the end of April when Mr. R. V. Morris acted for him, A. A. Campbell and G. A. Hodges; Surveyors (I), Messrs. R. V. Morris and A. J. Darby; Mr. C. Y. Sewell until end of April; Surveyors on agreement, Messrs. A. C. Every and W. Whittingdale, both now on the Establishment in Grade I, Messrs. J. Renton, W. T. S. Deacon, until November, J. W. Stack, until September, C. T. M. Husband, C. E. Bone and J. H. Spowers from November; Surveyor, Second Grade, Mr. H. R. Cholmeley; Surveyor Probationer, Mr. C. S. G. Budge from end of June; Assistant Surveyors, 3 Grade I, 6 Grade II, 11 Grade III, and 3 First Class Mandors; Draftsmen, 1 Special Grade, 7 Grade I, 4 Grade II, 15 Grade III, 34 Grade IV, 14 Probationers and 12 Tracers, etc.; Clerks, 2 Grade II and 2 Grade III.

CHANGES, ETC.

Mr. F. A. Sugden went on leave in January and returned in December. Messrs. E. G. Wood and C. Y. Sewell proceeded on leave in April. Mr. C. S. Budge joined in June from England as Surveyor Probationer. Mr. J. W. Stack was transferred to Selangor in November. Messrs. C. T. M. Husband, C. E. Bone and J. H. Spowers joined from Australia in November on agreement, and Mr. J. C. Drewet from New Zealand. Mr. W. R. S. Deacon terminated his agreement in December on account of ill-health. On termination of acting appointments above mentioned Messrs. E. W. Geyer and C. J. Perkins returned to Negri Sembilan.

Mr. H. R. Cholmeley was promoted from Probationer to Second Grade Surveyor in August. Mr. A. C. Every was transferred to the Pensionable Establishment as First Grade Surveyor.

HEALTH OF DIVISION AND EFFECTIVE STRENGTH.

The average number of days' absence from all causes during the year was about 30 days per man, of which about three days are attributable to sickness. The effective strength remained about the same as last year.

SELANGOR DIVISION.

EXPENDITURE AND REVENUE.

12. The total expenditure on Revenue Surveys in Selangor during 1913 was \$213,313, a considerably larger expenditure compared to the preceding year, but less than estimated owing to vacancies and leave. A sum of \$3,810 must be added to this on account of a Surveyor employed on Revenue Surveys in Selangor but paid by the Trigonometrical Branch. The cost of the Clerical Staff was \$3,640. The revenue collected was the highest ever returned in Selangor for any year—*viz.*, \$92,519, almost equivalent to the estimated value of fees sent out for collection. The value of the work done for other departments of Government is returned as \$6,573.

OUT-TURN AND COST.

(Field.)

There was an increase in the number of portions surveyed compared with 1912, but a slightly less acreage. The cost of the work per acre and per chain has increased compared with last year's rates, excepting as regards surveys of native holdings. For details see appendix C (ii).

(Office.)

The office out-turn is satisfactory, showing an increase in documents of title issued compared with 1912—see appendix D. The work of publishing a temporary edition from the old much worn manuscript compilations on the scale of 10 chains to the inch was commenced by the Surveyor-General and the greater part of Ulu Selangor completed.

PROGRESS WITH REFERENCE TO REQUISITIONS.

The position as regards requisitions for survey remains much the same as in the preceding year. There are less for agricultural grants left on the books, but slightly more for mining leases and mukim extracts for native holdings.

PARTICULARS OF WORK.

Work is well up to date in the Kuala Lumpur and Klang districts. In the Kuala Langat district a number of scattered native holdings are left to be dealt with. In the Ulu Langat district surveys are practically up to date. The mining applications in the Ulu Selangor district continue to absorb the energies of a large proportion of the field staff. Good progress has been made with them and there appears to be a falling off in the number of new requisitions. Owing to the nature of the country and the cost of connecting outlying portions the work in this part is very expensive. Survey of a large agricultural acreage was demanded in Kuala Selangor district, and good progress was made. The Superintendent, Revenue Surveys, again reports difficulty of settlement in this district.

New railway extension from Klang to Kuala Selangor, the Ampang branch line and railway deviations have caused a good deal of extra work of a troublesome and difficult nature. It is perhaps not generally realized what is involved in surveying for proper registration a railway line crossing a number of small portions of alienated land, entailing as it does the furnishing of a number of new diagrams of title.

Work in the Coast districts was much hampered by the flooded state of the land in the last four months of the year.

(*Forest Reserves.*)

Three forest reserves—*viz.*, "Bukit Belachan," "Bukit Enggang" and "Bukit Badong" were completely surveyed, comprising a total area of 8,803 acres; and part of "Kapar" Reserve was surveyed.

PERSONNEL.

Mr. H. R. Shaw, Superintendent, was in charge the whole year. Mr. R. Gillett, Office Assistant Superintendent, was in charge of the computing and drafting at headquarters, Kuala Lumpur, throughout the year. Assistant Superintendents (District Surveyors), Mr. C. J. Perkins from November only, Mr. W. A. Wallace, Mr. F. J. Gore until end of June, Mr. N. F. J. Haszard from September, Mr. F. R. Twiss (Trigonometrical Branch) (acting), Mr. D. S. Richards from January to November. Surveyor (I), Mr. O. E. Jansz; Surveyors (II), Mr. C. A. Rust, Mr. H. L. Penfold until June; Surveyor Probationer, Mr. R. A. Stubington (promoted to Second Grade in August), and Mr. R. C. Carter from June; Surveyors on agreement, Messrs. N. W. Jarvis and A. du T. Joubert until June and October, respectively, Messrs. R. C. Crossland and W. F. N. Bridges, Messrs. J. W. Stack and Ardlie from October, and Mr. Loudon from November; Assistant Surveyors, 2 Special Grade I, 1 Grade I, 2 Grade II, 10 Grade III, 2 Field Probationers and 4 First Class Mandors; Draftsmen, 5 Grade I, 5 Grade II, 8 Grade III, and 23 Grade IV, 14 Probationers and 12 Tracers, etc.; Clerks, 1 Grade I, 1 Grade II and 2 Grade III.

CHANGES.

Mr. F. J. Gore resigned the service in June. Messrs. N. W. Jarvis and A. du T. Joubert, Surveyors on agreement, returned to South Africa in July and November, respectively. Mr. D. S. Richards was transferred to Seremban in November and replaced by Mr. C. J. Perkins. Mr. H. L. Penfold was transferred to the Public Works Department in June. Mr. R. C. Carter, Surveyor Probationer, joined from England in June. Mr. J. W. Stack, Surveyor on agreement, was transferred from Perak in October. Messrs. A. W. Ardlie and W. F. Loudon joined from Australia on agreement in September and November, respectively.

HEALTH OF DIVISION AND EFFECTIVE STRENGTH.

The average number of days per man of absence from all causes was about 27, of which about five are recorded as on account of sickness. There was a slight general increase in the effective strength over the preceding year.

NEGRI SEMBILAN DIVISION.

EXPENDITURE AND REVENUE.

13. The expenditure on Revenue Surveys in the Negri Sembilan during 1913 was \$210,028 debited to the proper vote and a sum of \$4,510 paid out of other votes—in all \$214,538. This is more than during the preceding year, but less than estimated for. In addition, the Clerical Staff cost \$3,021.

The revenue collected was \$37,978, being less than in the preceding year by \$15,988, but still rather more than estimated. The value of work done for other Government departments amounted to \$38,132, of which work for the Forest Department cost \$10,336.

OUT-TURN AND COST.

(*Field.*)

The out-turn of field work was greater in 1913 than in any preceding year. Fewer agricultural lots were surveyed, but there was increase in the number surveyed for other purposes. The large area returned is due to forest reserves completed during the year. The cost per chain remained the same; the cost per acre was much less. The cost per acre for native holdings (\$3.92 per acre) is above the average; but in Negri Sembilan few of these holdings are in the flat country and those applied for now are seldom in large groups. Moreover, the average area is less than in the other States. For details *see* appendix C (iii).

(*Office.*)

There was a large increase also in the office out-turn. The number of documents of title of all kinds prepared was 4,560, which is in excess of any previous year. The arrears of office work in connection with a very large number of native holdings and agricultural grants incompletely or incorrectly surveyed and recorded in earlier years (previous to 1907) have been considerably reduced, though much still remains to be done in this respect. Most of the larger areas have been dealt with. The difficulty in obtaining trained and experienced Asiatic Computers and Draftsmen from outside, the consequent necessity and resultant delay of training them, have prevented the office work from keeping pace with the field work of re-survey.

Fair progress was made with the standard sheets on the 8-chain scale and work was continued on the 32-chain series; but there is still so much field work to compute and plot that these will not be sufficiently complete for publication for some time.

PROGRESS WITH REFERENCE TO REQUISITIONS.

Although there was a considerable increase in the number of requisitions during 1913, the balance in hand at the end of the year has been considerably reduced, and the acreage remaining to be dealt with is very much less. The arrears are chiefly office arrears. For details see appendix F (iii).

PARTICULARS OF WORK.

About 95 miles of secondary control traverses were surveyed, including one along the Kenaboi river. Circuit traverses to enable proper plans of old plane table surveys of native holdings to be made continue to be the most important field work in hand. A total length of 358 miles of such traverses were surveyed in 1913 to be compared with 75 miles in 1911 and 721 in 1912 for the same purpose. This work is confined to the Tampin and Kuala Pilah districts. It should be completed in the former during 1914, and in the latter during 1915. The survey for grants of old agricultural leases issued many years ago on plane table surveys is reported as now almost complete. The survey of building lots in Seremban town as now occupied by permanent buildings to replace titles issued long ago on plane table surveys was taken in hand and is now nearly complete. A detailed survey of roads and buildings within town limits was also commenced and considerable progress made with it. A new village was laid out at Bahau and another at Sepang Road was in hand at the end of the year.

(Forest Reserves.)

The forest reserves surveyed during the year under report were: "Paroh," 57,460 acres; "Senaling Inas," 20,035 acres; "Sungei Menyala," 2,400 acres; and "Sendayan Extension" (Protective Belt), 1,240 acres—in all 81,135 acres. The "Triang" Reserve and Extension and the "Labu Extension" were also in hand.

PERSONNEL.

Mr. C. M. Goodyear, Superintendent, was in charge throughout the year, with Mr. W. H. Hanson, Office Assistant Superintendent, in charge of the computing and drafting. Assistant Superintendents (District Surveyors), Messrs. E. Sweney and H. J. Mackenzie the whole year, Messrs. E. W. Geyer and E. E. P. Clare (two months each), Mr. C. J. Perkins (nine months), and Mr. T. Le Fevre (10 months). Surveyors (I), Messrs. E. C. Dew, A. P. Schreiber (11 months), and W. J. C. Stevens; Surveyor (II), Mr. L. M. Davenport; Surveyor Probationers, Mr. C. E. Nugent, and Mr. T. Kitching (seven months); Surveyors on agreement, Messrs. E. W. Matthews, G. W. Allom, F. M. Battye, and Mr. C. Wharton Kirke (one month); Assistant Surveyors, 1 Special Grade, 1 Grade I, 1 Grade II, 12 Grade III, 3 Field Probationers and 6 First Class Mandors; Draftsmen, 3 Grade I, 1 Grade II, 12 Grade III, 22 Grade IV, 16 Probationers and 18 Tracers, etc.; Clerks, 2 Grade II and 2 Grade III.

CHANGES, ETC.

Mr. E. W. Geyer returned in January from Johore, where he had been acting as Superintendent of Surveys, and left in February to act as Deputy Superintendent, Kinta, returning to Negri Sembilan in November, his place having in the meantime been taken by Mr. C. J. Perkins from Selangor. Mr. E. E. P. Clare went on leave in March. Mr. T. Le Fevre joined from leave in March. Mr. A. P. Schreiber returned from leave in January. Two Assistant Surveyors, Grade I, were retired on pension. At the beginning of December Mr. D. S. Richards, Assistant Superintendent, with nine Draftsmen of various grades, were transferred to the Revenue Survey Office, Seremban, to form a special section to deal with arrears of office work.

HEALTH OF DIVISION AND EFFECTIVE STRENGTH.

The average number of days' leave per man was 28, of which 16 are returned as on account of sickness. The high percentage of sickness in Negri Sembilan is due chiefly to a few cases of long periods, two of which have terminated in retirement. But it is partly due as in former years to the lack of suitable quarters for the office staff in Seremban. This deficiency is, however, now in course of being remedied. One European Surveyor, Mr. Allom, was incapacitated by malarial fever for a considerable time. There was a slight increase in the effective strength of the Division compared with the preceding year. In the last month of 1913 the office staff was considerably increased as previously stated.

PAHANG DIVISION.

EXPENDITURE AND REVENUE.

14. The expenditure on Revenue Surveys in Pahang in 1913 was \$130,547. From the amount debited to this service in the general account (*viz.*, \$133,721) must be deducted \$3,174, being the difference between the salary of a Surveyor paid from the Pahang Division vote but employed elsewhere and the salary of a Surveyor paid from the Perak Division vote but employed in Pahang. The increase in expenditure is due to the filling up of vacant appointments. In addition, the Clerical Staff cost \$2,179.

The revenue collected—*viz.*, \$36,377, was also considerably larger than the preceding year and in fact larger than any previously recorded, so that the net cost of the Establishment to Government has not been materially increased. Work to the value of \$9,880 was done for other departments of Government, nearly entirely (\$9,359) for the Forest Department.

OUT-TURN AND COST.

(Field.)

There was a considerable increase in area and chainage compared with the preceding year; but the cost-rates for all the most important work have considerably increased. This the Superintendent attributes to the smaller areas applied for and the heavy transport expenses incurred on many of the mining surveys. For details *see* appendix C (iv).

(Office.)

There was an increased output also in issue of documents of title, excepting mukim extracts (*see* appendix D). A strong room for the safe keeping of field books and certified plans was built during the year adjacent to the drafting room of the Lipis office.

PROGRESS WITH REFERENCE TO REQUISITIONS.

The number and acreage of requisitions for agricultural and mining lots not completely dealt with has been reduced; but there were more requisitions for native holdings surveys left outstanding at the end of the year than at the beginning. It is hoped that more progress will be shown in this respect in 1914. At present more work is being done in circuit traversing old incomplete surveys in order that they may be properly registered and mapped.

PARTICULARS OF WORK.

In the Lipis district the opening up of new communications—*viz.*, the Benta-Kuantan road, has given more work to the Surveyors in this part; and some work was done in connection with the boundaries of Jerantut town and reserves adjoining it. Some town lots were also surveyed there, but the laying out of a larger number of lots was wisely postponed for the present. A detail survey of Kuala Lipis town was carried out. The mining surveys in the Raub district and Bentong sub-district continue to take up most of the Surveyors' time. The necessary connection to many of these surveys in the remoter parts of the hills are very long, and on account of the nature of the country and high cost of labour very expensive. A fair proportion, however, of this expenditure is now recovered. A detail survey of Raub town was commenced. In the Temerloh district some large agricultural applications were completely dealt with. A European Surveyor was stationed at Pekan, and made good progress in the circuiting and connecting up of blocks of native holdings along the river. The work in the Kuantan district was well up to date at the end of the year.

(Forest Reserves.)

The following forest reserves were surveyed during the year: "Sungei Mangsok," 700 acres in Lipis district; "Jahit," 800 acres in the Raub district; and "Kuala Kuantan" and "Bukit Goh," 22,450 acres in all, in Kuantan district. The latter two were topographically surveyed to a certain extent for the benefit of the Forest Department by running compass traverses along streams and paths. Instructions have been given generally throughout the department for this to be done in the future.

PERSONNEL.

Mr. E. J. Kemplen, Superintendent, was in charge throughout the year. Mr. A. B. Allen was in charge of computing and drafting at the head office. Assistant Superintendent (District Surveyor), Mr. J. W. Johnston, on return from leave in November; Surveyors (I), Mr. W. A. Gummer who acted as District Surveyor, Kuantan district, Mr. E. Aune, acting as District Surveyor, Raub and Bentong; Surveyor (II), Mr. F. R. Whitten; Surveyor Probationer, Mr. W. H. Stubington; Surveyors on agreement, Messrs. J. T. Hockin, R. M. Carson, E. A. Kenney and F. H. Frodsham; Assistant Surveyors, 1 Grade I, 2 Grade II and 5 Grade III; Field Probationers 2, Special Class Mandors 1, First Class Mandors 3; Draftsmen, 2 Grade I, 1 Grade II, 5 Grade III and 18 Grade IV; Probationers 8 and Tracers, etc., 13.

CHANGES, ETC.

Mr. J. W. Johnston, Assistant Superintendent, joined from leave in November. Mr. W. A. Gummer proceeded on leave in December.

HEALTH OF DIVISION AND EFFECTIVE STRENGTH.

The average number of days per man of absence from all causes was 30, of which five are returned as on account of sickness. There was a small increase in the effective strength of the Establishment, more particularly in the field staff.

H. M. JACKSON, COLONEL,
Surveyor-General, F.M.S.

APPENDICES.

Return A.	Expenditure.
„ B.	Abstract of Expenditure and Revenue.
„ C.	Progress and Cost—Revenue Survey Branch, (F.M.S.).
„ C (i).	„ „ „ (Perak).
„ C (ii).	„ „ „ (Selangor).
„ C (iii).	„ „ „ (Negri Sembilan).
„ C (iv).	„ „ „ (Pahang).
„ D.	Office Work—Revenue Survey Branch, (F.M.S.).
„ F.	Revenue Survey work with reference to Requisitions (F.M.S.).
„ F (i).	„ „ „ (Perak).
„ F (ii).	„ „ „ (Selangor).
„ F (iii).	„ „ „ (Negri Sembilan).
„ F (iv).	„ „ „ (Pahang).
„ J.	Comparison of nominal and effective strength Revenue Survey Branch.

MAPS.*

Index Map showing Progress of Trigonometrical Surveys.
„ „ Topographical „
„ „ Revenue Surveys, Perak.
„ „ „ Selangor.
„ „ „ Negri Sembilan.
„ „ „ Pahang.

* Issued with bound copies only.

APPENDIX A.
COMPARATIVE RETURN OF SURVEY EXPENDITURE
(ACTUAL AND ESTIMATED).

	Expenditure, 1912.		Estimated, 1913.		Expenditure, 1913.	
	Detail.	Totals.	Detail.	Totals.	Detail.	Totals.
	\$	\$	\$	\$	\$	\$
Central Survey Office {						
Surveyor-General's Office ...					29,081	
Drawing Office ...					11,807	
Photo-Litho. Section ...	...	54,682	...	94,901	18,553	73,666 <i>a</i>
Instrument Repairing ...					5,125	
Survey School... }					9,100	
Colonial Survey Section ...	...	36,142	...	50,000	...	53,797
Trigonometrical Branch ...	...	113,595	...	175,107	...	102,989
Topographical " ...	...	82,558	...	114,332	...	77,981
Revenue Survey {						
Perak ...	297,141	...	...	...	291,124	
Selangor ...	190,040	...	...	...	213,183	
Negri Sembilan ...	186,441	...	...	...	214,166	
Pahang ...	117,933	...	...	...	130,547	
		791,555		1,016,034		849,020 <i>a</i>
Totals ...	...	1,078,532	...	1,450,374	...	1,157,453 *
SPECIAL EXPENDITURE.						
Town Map, Kuala Lumpur ...	...	...	...	6,756	...	4,874 <i>b</i>
Miscellaneous ...	...	...	...	2,406	...	2,144 <i>c</i>

(a) Excluding Special Expenditure.

(b) Paid by Surveyor-General's Office. \$1,297 in addition are included in Topographical Expenditure.

(c) Central Survey Office (Apparatus and Furniture), \$2,014
Selangor Revenue Survey (Typewriting Machine), 130

* In addition, \$19,767 not included in the Survey Department Estimates was expended on Clerical Service.

APPENDIX C.

PROGRESS AND COST RETURN, REVENUE SURVEY BRANCH, TOTAL, F.M.S.
FIELD WORK.

Nature of Survey Works, etc.	1912.							1913.							Remarks.
	Lots.	Acres.	Chains.	Cost per lot.	Cost per acre.	Cost per chain.	Total Cost.	Lots.	Acres.	Chains.	Cost per lot.	Cost per acre.	Cost per chain.	Total cost.	
				\$ c.	\$ c.	\$ c.	\$				\$ c.	\$ c.	\$ c.	\$	
1. Town and Village Lots ...	938	...	3,991	7 79	...	1 83	1,204	1,078	8	5,382	9 77	...	1 96	10,529	
1A. Residential " ...	32	...	1,072	37 63	...	1 12	7,308	120	...	2,856	22 77	...	0 95	2,732	
2. Mining " ...	1,448	31,649	84,816	56 67	2 59	0 97	82,060	1,204	24,123	77,016	67 81	3 38	1 06	81,643	
3. Agricultural " ...	2,253	107,714	118,212	43 99	0 92	0 84	99,101	1,480	75,550	91,768	58 36	1 14	0 89	86,378	
4. Forest Reserves ...	15	74,656	12,839	...	0 16	0 94	12,048	20	119,254	20,628	...	0 16	0 89	18,405	
4A. Other Government Reserves (excl. 5 and 5A) ...	170	8,288	16,901	...	1 40	0 69	11,635	216	3,859	13,415	...	3 01	0 87	11,636	
5. Road Reserves ...	...	...	10,661	...	...	0 73	7,802	...	...	13,983	...	...	0 90	12,416
5A. Railway " ...	...	...	1,920	...	...	0 83	1,588	...	...	5,838	...	...	0 62	3,595
6. Native Holdings (a) ...	5,297	17,355	89,792	9 78	2 99	0 58	51,828	14,018	44,445	243,838	7 42	2 34	0 42	104,016	
7. " (b) ...	6,316	20,281	136,160	8 69	2 64	0 29	30,211	183	718	5,075	6 46	1 65	0 23	1,182	
8. Circuit Traverses ...	...	...	83,774	...	...	0 61	51,018	...	...	88,204	...	...	0 64	56,017
9. Connections ...	...	...	26,612	...	...	0 69	18,394	...	...	25,464	...	...	0 88	22,307
10. Control Traverses ...	...	...	10,960	...	...	0 94	10,318	...	...	12,366	...	...	1 08	13,354
11. River ...	...	...	2,745	...	...	0 42	1,142	...	...	5,594	...	...	0 45	2,531
12. District and Town Boundaries ...	...	...	743	0 80	...	0 80	596	...	...	1,311	...	...	1 20	1,577
13. Sub-divisional Surveys ...	...	...	17,825	...	...	0 69	12,255	...	...	19,510	...	...	0 73	14,160
13A. " Demarcation ...	...	...	8,310	...	...	0 22	1,791	...	...	10,022	...	...	0 20	2,022
14. Minor Surveys not otherwise classified ...	...	...	1,246	...	...	0 63	788	...	...	2,515	...	...	0 96	2,428
15. Mining Certificates ...	188	3,157	10,514	15 54	0 93	0 28	2,922	161	2,356	8,474	18 68	1 28	0 35	3,007	
16. Prospecting Licences ...	8	1,710	1,106	...	...	...	293	1	70	275	...	...	...	51
17. Miscellaneous Field Duties ...	...	...	717	...	...	...	7,185	...	...	755	...	...	...	8,339
18. Special Surveys ...	...	...	326	...	...	...	407	...	...	1,904	...	...	...	1,549
19. Detail Surveys of Towns ...	...	...	378	...	...	...	283	...	...	3,616	...	...	...	2,886
20. Miscellaneous, Topo., etc. ...	...	...	381	...	...	...	146	...	...	4,149	...	...	...	1,455
Totals and Mean Cost ...	16,665	264,810 413.8 sq. miles	642,001 8,025.01 miles	...	1 56	0 64	412,323	18,481	270,375 422.46 sq. miles	663,958 8,299.5 miles	...	1 72	0 70	464,215	

(a) Complete Theodolite Surveys. (b) Partly Plane-table and Compass Surveys.

APPENDIX C (i).

PROGRESS AND COST RETURN, REVENUE SURVEY BRANCH, PERAK.

FIELD WORK.

Nature of Survey Works, etc.	1912.							1913.							Remarks.
	Lots.	Acres.	Chains.	Cost per lot.	Cost per acre.	Cost per chain.	Total cost.	Lots.	Acres.	Chains.	Cost per lot.	Cost per acre.	Cost per chain.	Total cost.	
				\$ c.	\$ c.	\$ c.	\$				\$ c.	\$ c.	\$ c.	\$	
1. Town and Village Lots ...	623	...	2,433	7 01	...	1 79	4,265	383	...	1,806	8 94	...	1 90	3,425	
1A. Residential " ...	4	...	121	24 50	...	0 81	98	28	31	670	19 82	17 90	0 83	555	
2. Mining " ...	782	18,064	44,409	47 95	2 08	0 84	37,497	502	10,547	35,086	58 60	2 79	0 84	29,416	
3. Agricultural " ...	856	39,900	50,786	38 81	0 83	0 65	33,221	690	18,721	37,073	42 45	1 56	0 79	29,291	
4. Forest Reserves ...	8	47,547	5,748	676 37	0 11	0 94	5,411	3	5,412	3,667	1,104 33	0 61	0 90	3,313	
4A. Other Government Reserves (excl. 5 and 5A) ...	60	6,046	11,164	106 62	1 06	0 57	6,397	45	2,109	5,913	97 24	2 07	0 74	4,376	
5. Road Reserves ...	...	...	5,447	...	...	0 31	1,667	...	...	5,063	...	...	0 65	3,315
5A. Railway " ...	...	...	...	...	...	...	...	...	...	147	...	...	0 35	51
6. Native Holdings (a) ...	5,212	17,151	110,481	4 89	1 49	0 23	25,507	6,532	21,235	122,777	5 38	1 65	0 29	35,111	
7. " (b) ...	...	...	44,823	...	...	0 44	19,768	...	...	44,909	...	...	0 48	21,776
8. Circuit Traverses ...	...	...	10,566	...	...	0 59	6,208	...	...	8,063	...	...	0 67	5,362
9. Connections ...	...	...	7,483	...	...	0 86	6,446	...	...	1,015	...	...	0 84	857
10. Control Traverses ...	...	...	1,358	...	...	0 27	367	...	...	3,764	...	...	0 28	1,051
11. River " ...	...	...	689	...	...	0 81	556	...	...	299	...	...	1 14	340
12. District and Town Boundaries ...	...	...	9,464	21 73	1 28	0 58	5,455	249	...	4,472	15 19	...	0 85	3,782
13. Sub-divisional Surveys ...	251	4,260	7,424	7 13	...	0 23	1,696	331	...	9,936	6 01	...	0 20	1,989	
13A. " Demarcation ...	238	...	...	...	...	...	...	...	...	...	...	...	...	...
14. Minor Surveys not otherwise classified ...	...	...	720	...	...	0 59	426	...	...	324	...	...	2 35	760
15. Mining Certificates ...	...	...	...	...	...	...	...	1	70	275	51 00	0 73	0 19	51
16. Prospecting Licences ...	...	...	...	...	...	...	...	...	...	467	...	...	1 08	506
17. Miscellaneous Field Duties ...	...	...	41	...	...	0 32	13	...	...	1,824	...	...	0 25	449
18. Special Surveys ...	...	...	300	...	...	0 37	111	...	...	...	...	...	...	...
19. Detail Surveys of Towns ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20. Miscellaneous, Topo., etc. ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Totals and Mean Cost ...	8,034	132,968	313,457	...	...	...	155,266	8,764	58,125	287,552	...	...	...	145,776

(a) Complete Theodolite Surveys. (b) Partly Plane-table and Compass Surveys.

APPENDIX C (ii).
 PROGRESS AND COST RETURN, REVENUE SURVEY BRANCH, SELANGOR.
 FIELD WORK.

Nature of Survey Works, etc.	1912.							1913.							Remarks.
	Lots.	Acres.	Chains.	Cost per lot.	Cost per acre.	Cost per chain.	Total cost.	Lots.	Acres.	Chains.	Cost per lot.	Cost per acre.	Cost per chain.	Total cost.	
				\$ c.	\$ c.	\$ c.	\$ c.				\$ c.	\$ c.	\$ c.	\$ c.	
1. Town and Village Lots ...	145	...	931	10 20	...	1 59	1,478 65	479	...	2,443	10 16	...	1 99	4,869 81	
1A. Residential " ...	20	77	711	41 46	10 77	1 17	829 39	11	17	181	26 79	17 34	1 62	294 79	
2. Mining " ...	427	5,908	24,096	52 84	3 81	0 93	22,562 50	401	7,348	23,139	66 21	3 61	1 14	26,553 83	
3. Agricultural " ...	337	35,783	25,202	73 12	0 69	0 97	24,641 68	397	33,649	28,617	72 89	0 86	1 01	28,939 15	
4. Forest Reserves ...	3	21,463	4,954	1,203 28	0 16	0 93	3,609 85	3	8,893	2,972	641 23	0 21	0 64	1,923 69	
4A. Other Government Reserves (excl. 5 and 5A) ...	52	1,692	3,539	65 89	2 02	0 97	3,426 23	24	65	798	38 72	14 29	1 16	929 35	
5. Road Reserves ...	...	...	2,356	...	...	1 14	2,682 49	...	...	5,259	...	...	0 76	4,004 29
5A. Railway " ...	...	...	1,421	...	...	0 71	1,013 95	...	...	2,384	...	...	0 36	876 45
6. Native Holdings (a) ...	2,137	8,438	33,927	9 21	2 33	0 58	19,683 76	2,483	9,054	38,853	7 66	2 10	0 49	19,038 55	
7. " (b) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8. Circuit Traverses ...	...	...	1,117	...	...	0 93	1,041 51	...	...	519	...	...	0 58	306 07
9. Connections ...	...	...	3,282	...	...	0 80	2,641 28	...	...	2,583	...	...	0 68	1,756 98
10. Control Traverses ...	...	...	...	...	...	...	...	...	...	601	...	...	0 90	546 40
11. River " ...	...	...	1,059	...	...	0 55	578 00	...	...	1,830	...	...	0 80	1,479 66
12. District and Town Boundaries	...	...	...	...	...	...	...	...	...	526	...	...	1 43	753 91
13. Sub-divisional Surveys ...	551	...	7,223	11 21	...	0 85	6,178 74	789	...	11,200	8 80	...	0 62	6,944 48	
13A. " Demarcation ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14. Minor Surveys not otherwise classified ...	7	12	514	44 10	25 73	0 60	308 73	...	...	1,387	...	...	0 77	1,078 91
15. Mining Certificates ...	185	3,082	10,215	14 63	0 88	0 26	2,707 67	152	2,119	7,784	16 21	1 16	0 31	2,464 19	
16. Prospecting Licences ...	8	1,710	1,106	36 63	0 17	0 26	293 09	...	...	...	...	...	...	...
17. Miscellaneous Field Duties ...	1	...	682	...	...	...	5,228 22	...	...	280	...	...	...	7,146 35
18. Special Surveys ...	12	9	276	25 77	34 37	1 12	309 29	2	8	735	290 78	72 69	0 79	581 57	
19. Detail Surveys of Towns ...	...	...	...	...	...	...	...	6	...	26	33 16	...	7 65	198 98
20. Miscellaneous, Topo., etc. ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Totals and Mean Cost ...	3,885	78,174	122,611	...	...	...	99,215 03	4,747	61,153	132,117	...	...	...	110,687 41

(a) Complete Theodolite Surveys. (b) Partly Plane-table and Compass Surveys.

APPENDIX C (iii).

PROGRESS AND COST RETURN, REVENUE SURVEY BRANCH, NEGRI SEMBILAN.

FIELD WORK.

Nature of Survey Works, etc.	1912.							1913.							Remarks.
	Lots.	Acres.	Chains.	Cost per lot.	Cost per acre.	Cost per chain.	Total cost.	Lots.	Acres.	Chains.	Cost per lot.	Cost per acre.	Cost per chain.	Total cost.	
				\$ c.	\$ c.	\$ c.	\$ c.				\$ c.	\$ c.	\$ c.	\$ c.	
1. Town and Village Lots ...	168	20	582	8 39	...	2 42	1,410 22	168	8	981	10 80	...	1 85	1,814 96	
1A. Residential " ...	8	24	240	35 23	11 74	1 17	281 82	79	151	1,980	22 78	11 84	0 91	1,799 57	
2. Mining " ...	117	2,659	8,233	82 06	3 61	1 16	9,601 60	154	2,977	9,432	71 17	3 68	1 16	10,959 68	
3. Agricultural " ...	1,025	20,750	36,641	34 08	1 68	0 95	34,936 71	342	14,179	19,555	57 27	1 38	1 00	19,587 82	
4. Forest Reserves ...	3	4,235	1,452	557 28	0 39	1 15	1,671 83	5	81,135	9,089	1,886 74	0 11	1 01	9,533 72	
4A. Other Government Reserves (excl 5 and 5A) ...	53	533	1,964	29 51	2 93	0 79	1,563 95	94	706	3,758	36 11	4 81	0 90	3,394 56	
5. Road Reserves ...	...	...	1,905	...	...	1 28	2,431 48	...	...	2,952	...	...	1 28	3,788 89
5A. Railway " ...	...	...	380	...	...	1 20	455 71	...	...	2,540	...	...	0 79	2,008 18
6. Native Holdings (a) ...	2,411	6,338	41,928	10 48	3 98	0 60	25,262 94	3,529	8,908	57,081	9 90	3 92	0 61	34,950 92	
7. " (b) ...	...	...	17,670	...	...	0 86	15,285 06	...	...	28,647	...	...	0 84	24,191 22
8. Circuit Traverses ...	...	...	9,497	...	...	0 61	5,816 75	...	...	7,345	...	...	0 77	5,675 74
9. Connections ...	...	...	1,690	...	...	0 97	1,642 77	...	...	7,573	...	...	0 97	7,306 07
10. Control Traverses ...	...	...	54	...	...	0 74	39 82	...	...	195	...	...	1 27	247 29
11. River " ...	...	...	1,078	9 43	0 23	0 52	565 92	335	6,719	3,261	9 36	0 46	0 96	3,135 23
12. District and Town Boundaries ...	60	2,495	429	2 22	0 92	0 06	26 59	...	...	804	...	...	0 71	568 55
13. Sub-divisional Surveys ...	12	29	...	...	...	...	35 31	...	...	702	...	...	0 66	461 36
13A. " Demarcation ...	...	...	357	...	...	0 76	270 41	...	...	2,841	...	...	0 74	2,096 40
14. Minor Surveys not otherwise classified ...	...	...	81	...	...	0 27	21 93	...	...	2,325	...	...	0 33	762 23
15. Mining Certificates ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16. Prospecting Licences ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17. Miscellaneous Field Duties ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18. Special Surveys ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19. Detail Surveys of Towns ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20. Miscellaneous, Topo., etc. ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Totals and Mean Cost ...	3,857	37,083	124,193	19 53	2 73	0 81	101,374 06	4,706	114,783	161,024	...	1 15	0 82	132,282 39	

(a) Complete Theodolite Surveys. (b) Partly Plane-table and Compass Surveys.

APPENDIX C (iv).

PROGRESS AND COST RETURN, REVENUE SURVEY BRANCH, PAHANG.

FIELD WORK.

Nature of Survey Works, etc.	1912.							1913.							Remarks.
	Lots.	Acres.	Chains.	Cost per lot.	Cost per acre.	Cost per chain.	Total cost.	Lots.	Acres.	Chains.	Cost per lot.	Cost per acre.	Cost per chain.	Total cost.	
				\$ c.	\$ c.	\$ c.	\$ c.				\$ c.	\$ c.	\$ c.	\$ c.	
1. Town and Village Lots ...	2	...	45	27 08	...	1 20	54 16	48	...	152	8 72	...	2 75	418 80	
1A. Residential " ...	...	...	...	...	...	...	...	2	1½	25	40 78	54 37	3 26	81 56
2. Mining " ...	122	5,018	8,078	101 62	2 47	1 53	12,398 24	147	3,224	9,359	100 08	4 56	1 57	14,712 88	
3. Agricultural " ...	35	11,281	5,583	180 04	0 56	1 13	6,301 25	51	9,001	6,523	167 84	0 95	1 31	8,560 11	
4. Forest Reserves ...	1	1,411	685	1,355 29	0 96	1 98	1,355 29	9	23,814	4,900	403 81	0 15	0 74	3,634 26	
4A. Other Government Reserves (excl. 5 and 5A) ...	5	17	234	49 52	14 56	1 06	247 59	53	979	2,946	55 39	3 00	1 00	2,935 69	
5. Road Reserves ...	...	...	953	...	...	1 07	1,021 93	...	...	709	...	...	1 84	1,307 79
5A. Railway " ...	...	...	119	...	...	0 99	118 11	3	30	767	220 14	22 01	0 86	660 43
6. Native Holdings (a) ...	749	2,579	13,937	9 19	2 67	0 49	6,881 79	1,474	5,428	25,127	10 12	2 84	0 59	14,915 91	
7. " (b) ...	1,104	3,130	25,679	4 26	1 50	0 19	4,704 64	183	718	5,075	6 46	1 65	0 23	1,182 24	
8. Circuit Traverses ...	...	...	2,404	...	...	0 93	2,228 11	...	...	14,129	...	...	0 69	9,743 81
9. Connections ...	...	...	3,267	...	...	1 14	3,727 88	...	...	7,473	...	...	1 27	9,511 82
10. Control Traverses ...	...	...	1,787	...	...	1 25	2,228 61	...	...	3,177	...	...	1 46	4,645 85
11. River " ...	...	...	328	...	...	0 60	196 97	...	...	291	...	...	0 81	236 01
12. District and Town Boundaries	...	...	...	...	...	...	...	...	...	577	7 87	3 98	0 52	298 87
13. Sub-divisional Surveys ...	4	19	60	13 78	2 90	0 92	55 10	38	75	577	7 87	3 98	0 52	298 87	
13A. " Demarcation ...	25	62	457	2 71	1 09	0 15	67 73	6	10	86	5 48	3 29	0 38	32 90	
14. Minor Surveys not otherwise classified ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15. Mining Certificates ...	3	75	299	71 38	2 86	0 72	214 13	9	237	690	60 33	2 29	0 79	543 01	
16. Prospecting Licences ...	...	...	17,795	...	...	0 82	14,651 75	...	...	475	...	...	2 51	1,193 02
17. Miscellaneous Field Duties ...	...	...	50	...	...	0 12	6 06	...	...	749	...	...	0 79	590 99
18. Special Surveys ...	...	...	...	...	...	...	13 46	...	...	...	...	...	...	244 33
19. Detail Surveys of Towns ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20. Miscellaneous, Topo., etc. ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Totals and Mean Cost ...	2,050	23,592	81,760	...	...	...	56,472 80	2,023	43,518	83,230	...	...	...	75,470 01

(a) Complete Theodolite Surveys. (b) Partly Plane-table and Compass Surveys.

APPENDIX D.

RETURN OF OFFICE WORK IN REVENUE SURVEY OFFICES, 1913.

Detail.	Perak.		Selangor.		Negri Sembilan.		Pahang.		Total.	
	1912.	1913.	1912.	1913.	1912.	1913.	1912.	1913.	1912.	1913.
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
(I).—DOCUMENTS FOR REGISTRATION OF TITLE, ETC.										
Grants (Country), in duplicate	811	596	196	273	531	759	27	46	1,565	1,674
„ (Town or Village), in duplicate	331	345	59	287	40	156	65	105	495	893
Certificates of Title (Country), in duplicate	208	346	69	70	34	51	...	...	311	467
„ (Town or Village), in duplicate	74	121	150	101	82	138	...	...	306	360
Mining Leases, in duplicate	647	533	539	387	123	127	115	158	1,424	1,205
„ Certificates, in duplicate	193	78	185	168	39	26	12	14	429	286
Prospecting Licences, in duplicate... ..	104	73	39	32	2	12	...	29	145	146
Extracts, Mukim Register (Native Holdings)	6,019	8,459	2,251	3,104	1,522	2,734	2,550	1,415	12,342	15,712
Certified Plans (including Reserves), completed	1,593	1,562	836	903	397	511	217	365	3,043	3,341
Miscellaneous Leases, Burial Licences, etc.	47	37	7	7	56	46	6	22	116	112
Total	10,027	12,150	4,331	5,332	2,826	4,560	2,992	2,154	20,176	24,196
(II).—COMPUTATIONS, MAPPING AND MISCELLANEOUS.										
Traverse Lines, computed	51,194	55,730	63,413	65,705	20,123	21,151	15,973	19,943	150,703	162,529
Astro. Azimuths, computed	29	36	363	143	73	95	48	149	513	423
M.S. Plans of Standard Sheets, 4 ch. to 1 in., in hand	100	83	...	...	103	119	116	81	319	283
„ „ „ „ 4 „ „ completed ... ..	...	1	...	...	...	...	...	...	...	1
„ „ „ „ 8 „ „ in hand ... ..	...	...	19	5	168	185	...	...	187	190
„ „ „ „ 8 „ „ completed ... ..	...	...	...	...	...	...	...	...	...	...
„ „ „ „ 16 „ „ in hand	58	69	...	...	...	...	11	18	69	87
„ „ „ „ 16 „ „ completed	19	67	...	...	...	...	...	...	19	67
Town Sheets „ „ 1 „ „ in hand	26	10	19	7	68	74	...	6	113	97
„ „ „ „ 1 „ „ completed ... ..	...	3	40	...	...	...	...	...	40	3
„ „ „ „ 50 lks „ „ in hand ... ..	...	...	...	...	...	...	...	...	...	...
„ „ „ „ 50 „ „ completed ... ..	...	...	...	...	...	...	...	...	...	...
Tracings (new) of whole Sheets	92	175	4	24	13	23	30	143	139	365
Miscellaneous Tracings, etc., made and issued	2,384	2,653	4,859	6,314	1,313	1,936	1,801	1,669	10,357	12,572
Descriptions prepared for <i>Gazette</i>	100	80	73	55	99	100	25	45	297	280
District and Miscellaneous Maps compiled ... ..	...	...	...	...	...	...	...	...	...	...
State Maps revised ... ..	...	...	...	...	...	...	1	...	1	...

APPENDIX F.

RETURN SHOWING STATE OF SURVEY WORK WITH REFERENCE TO REQUISITIONS.

(FEDERATED MALAY STATES.)

Details.	Agricultural lots.		Mining lots.		Native holdings.		Town lots.	Residential lots.		Reserves.		Sub-divisions.	Miscellaneous.	Remarks.
	Number.	Acres.	Number.	Acres.	Number.	Acres.	Number.	Number.	Acres.	Number.	Acres.	Number.	Number.	
Unsatisfied Requisitions on the 1st January, 1913 ...	2,464	124,589	928	20,560	24,835	70,928	693	1	3	225	31,747	1,038	95	
Requisitions Received in 1913 ...	1,351	53,367	1,398	30,072	14,970	46,399	1,224	80	237	297	128,322	1,355	35	
Total of above ...	3,815	177,956	2,326	50,632	39,805	117,327	1,917	81	240	522	160,069	2,393	130	
Requisitions Satisfied during 1913	1,591	117,399	1,151	23,457	9,206	28,610	1,112	28	92	194	28,704	1,127	114	
" Cancelled " ...	24	5,203	115	3,223	871	3,041	125	8	34	12	606	17		
" Remaining Unsatisfied on the 31st December, 1913	2,200	55,354	1,060	23,952	29,728	85,676	680	45	114	316	130,759	1,249	16	
Total agreeing with total above	3,815	177,956	2,326	50,632	39,805	117,327	1,917	81	240	522	160,069	2,393	130	
DETAILS. UNSATISFIED REQUISITIONS.														
Awaiting Survey or Demarcation In Hand in Field	190	12,694	493	11,106	14,030	39,007	205	27	75	141	90,599	347	6	
Demarcation awaiting Circuit ... In Land Office for Settlement ... In S. O. awaiting Settlement of Queries	90	9,680	172	3,405	6,479	21,566	108	4	21	28	10,870	480	7	
" Drafting, etc.	55	11,590	1	46	1,196	3,884	45	...	...	16	556	26		
" In Hand	23	2,722	20	331	265	929	57	...	...	8	23,130	6		
	1,450	6,612	127	4,112	5,401	12,718	184	9	8	40	174	291		
	392	12,056	247	4,952	2,357	7,572	81	5	10	83	5,470	99	3	
Total Unsatisfied Requisitions	2,200	55,354	1,060	23,952	29,728	85,676	680	45	114	316	130,759	1,249	16	

NOTE.—(1) A Requisition is "satisfied" when the work of the Survey Department is so far completed that titles can be supplied when demanded.

APPENDIX F (i).

RETURN SHOWING STATE OF SURVEY WORK WITH REFERENCE TO REQUISITIONS.

(PERAK.)

Details.	Agricultural lots.			Mining lots.			Native holdings.			Town lots.		Residential lots.		Reserves.		Sub-divisions.		Miscellaneous.		Remarks.
	Req.	Lots.	Acres.	Req.	Lots.	Acres.	Req.	Lots.	Acres.	Req.	Lots.	Req.	Acres.	Req.	Acres.	Req.	Lots.	Req.	Items.	
Unsatisfied Requisitions on the 1st January, 1913 ...	339	387	18,426	223	412	8,955	1,403	9,650	30,547	46	317	...	...	48	28,734	189	407	14	14	
Requisitions Received in 1913 ...	482	562	19,465	415	650	14,680	763	5,485	17,393	70	297	13	62	106	13,147	314	595	14	14	
Total of above ...	821	949	37,891	638	1,062	23,635	2,166	15,135	47,940	116	614	13	62	154	41,881	503	1,002	28	28	
Requisitions Satisfied during 1913	562	627	25,142	365	530	10,983	585	5,203	16,649	67	338	4	27	69	25,879	260	515	26	26	
" Cancelled " "	5	6	1,568	6	7	91	27	340	996	7	11	...	...	1	2	10	11			
" Remaining Unsatisfied on the 31st December, 1913	254	316	11,181	267	525	12,561	1,554	9,592	30,295	42	265	9	35	84	16,000	233	476	2	2	
Total agreeing with total above	821	949	37,891	638	1,062	23,635	2,166	15,135	47,940	116	614	13	62	154	41,881	503	1,002	28	28	
DETAILS. UNSATISFIED REQUISITIONS.																				
Awaiting Survey or Demarcation In Hand	90	99	2,642	113	203	5,337	636	3,298	10,267	11	88	6	10	40	1,252	73	175			
Demarcation awaiting Circuit In Land Office for Settlement	47	56	4,698	37	81	1,407	104	925	2,822	12	34	1	18	12	10,529	74	184	2	2	
In S. O. awaiting Settlement of Queries	18	20	875	...	...	...	508	3,692	11,687	...	...	...	...	...	...	5	5			
" Drafting, etc. In Hand	2	8	1,546	1	1	15	7	45	215	3	29	...	...	1	2,500	6	6			
" In Hand	20	23	176	49	80	2,395	86	347	1,106	3	32	...	...	1	15	4	13			
" In Hand	77	110	1,244	67	160	3,407	160	1,099	3,671	9	40	2	7	22	1,200	55	76			
Total Unsatisfied Requisitions	254	316	11,181	267	525	12,561	1,554	9,592	30,295	42	265	9	35	84	16,000	233	476	2	2	

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

APPENDIX F (ii).

RETURN SHOWING STATE OF SURVEY WORK WITH REFERENCE TO REQUISITIONS.

(SELANGOR.)

Details.	Agricultural lots.			Mining lots.			Native holdings.			Town lots.		Residential lots.		Reserves.		Sub-divisions.		Miscellaneous.		Remarks.
	Req.	Lots.	Acres.	Req.	Lots.	Acres.	Req.	Lots.	Acres.	Req.	Lots.	Req.	Acres.	Req.	Acres.	Req.	Lots.	Req.	Items.	
Unsatisfied Requisitions on the 1st January, 1913 ...	101	124	40,092	151	158	2,347	204	2,154	8,026	27	228	1	3	26	499	37	240	80		
Requisitions received in 1913 ...	165	191	21,732	358	399	7,943	381	3,312	11,216	36	460	1	38	20	1,820	191	398	21		
Total of above ...	266	315	61,824	509	557	10,290	585	5,466	19,242	63	688	2	41	46	2,319	228	638	101		
Requisitions Satisfied during 1913	172	205	37,612	325	356	5,830	181	1,387	4,265	42	622	2	41	22	1,785	165	346	87		
" Cancelled " "	10	11	2,696	16	17	235	7	10	41	1	19	...	...	1	1	2	4		
" Remaining Unsatisfied on the 31st December, 1913	84	59	21,516	168	184	4,225	397	4,069	14,936	20	47	...	...	23	533	61	288	14	
Total agreeing with total above	266	315	61,824	509	557	10,290	585	5,466	19,242	63	688	2	41	46	2,319	228	638	101		
DETAILS. UNSATISFIED REQUISITIONS.																				
Awaiting Survey or Demarcation In hand	31	37	9,480	75	81	2,283	132	1,806	6,390	14	19	...	...	11	115	13	31	6	
Demarcation awaiting circuit	22	22	4,676	54	59	1,352	62	1,194	4,743	1	1	...	...	1	7	48	257	5	
In Land Office for Settlement	...	...	...	...	...	...	11	55	287	...	...	...	...	...	...	...	...	...	...
In S. O. awaiting Settlement of Queries	3	4	245	1	1	5	22	76	273	5	27	...	...	...	...	...	...	...	...
" Drafting, etc.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" In Hand	28	36	7,115	38	43	585	77	221	731	...	...	...	...	11	411	...	...	3	
Total Unsatisfied Requisitions ...	84	99	21,516	168	184	4,225	397	4,069	14,936	20	47	...	...	23	533	61	288	14	

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

APPENDIX F (iii).

RETURN SHOWING STATE OF SURVEY WORK WITH REFERENCE TO REQUISITIONS.

(NEGRI SEMBILAN.)

Details.	Agricultural lots.			Mining lots.			Native holdings.			Town lots.		Residential lots.		Reserves.		Sub-divisions.		Miscellaneous.		Remarks.
	Req.	Lots.	Acres.	Req.	Lots.	Acres.	Req.	Lots.	Acres.	Req.	Lots.	Req.	Acres.	Req.	Acres.	Req.	Lots.	Req.	Items.	
Unsatisfied Requisitions on the 1st January, 1913	1,889	50,586	...	136	3,490	...	6,479	15,569	...	42	...	...	120	1,399	...	391	1	1	
Requisitions Received in 1913	560	9,884	...	126	3,252	...	2,986	7,837	...	455	66	137	79	487	...	362			
Total of above	2,449	60,470	...	262	6,742	...	9,465	23,406	...	497	66	137	199	1,886	...	753	1	1	
Requisitions Satisfied during 1913	...	710	46,384	...	108	1,942	...	1,257	3,380	...	106	22	24	64	645	...	266	1	1	
" Cancelled "	...	4	809	...	21	1,413	...	241	1,357	...	35	8	34	4	6	...	2			
" Remaining Unsatisfied on 31st December, 1913	1,735	13,277	...	133	3,387	...	7,967	18,669	...	356	36	79	131	1,235	...	485			
Total agreeing with total above...	...	2,449	60,470	...	262	6,742	...	9,465	23,406	...	497	66	137	199	1,886	...	753	1	1	
DETAILS. UNSATISFIED REQUISITIONS.																				
Awaiting Survey or Demarcation In hand	...	39	346	...	30	580	...	2,136	5,097	...	96	21	65	47	355	...	141			
Demarcation awaiting circuit	...	5	165	...	22	383	...	81	142	...	73	3	3	8	183	...	34			
In Land Office for Settlement	...	18	2,117	...	1	46	...	113	286	...	...	...	...	8	52	...	9			
In S. O. awaiting Settlement of Queries	...	3	601	...	9	186	...	...	...	...	...	...	...	1	5	...				
" Drafting, etc.,	...	1,427	6,436	...	47	1,717	...	5,054	11,612	...	152	9	8	39	159	...	278			
" In Hand	...	243	3,612	...	24	475	...	583	1,532	...	35	3	3	28	481	...	23			
Total Unsatisfied Requisitions	1,735	13,277	...	133	3,387	...	7,967	18,669	...	356	36	79	131	1,235	...	485			

NOTE.—(1) A Requisition is "satisfied" when the work of the Survey Department is so far completed that titles can be supplied when demanded.

APPENDIX F (iv).

RETURN SHOWING STATE OF SURVEY WORK WITH REFERENCE TO REQUISITIONS.

(PAHANG.)

Details.	Agricultural lots.			Mining lots.			Native holdings.			Town lots.		Residential lots.		Reserves.		Sub-divisions.		Miscellaneous.		Remarks.
	Req.	Lots.	Acres.	Req.	Lots.	Acres.	Req.	Lots.	Acres.	Req.	Lots.	Req.	Acres.	Req.	Acres.	Req.	Lots.	Req.	Items.	
Unsatisfied Requisitions on the 1st January, 1913	64	15,485	...	222	5,768	...	6,552	16,786	...	106	...	...	31	1,115					
Requisitions Received in 1913	38	2,286	...	223	4,197	...	3,187	9,953	...	12	...	...	92	112,868					
Total of above	102	17,771	...	445	9,965	...	9,739	26,739	...	118	...	...	123	113,983					
Requisitions Satisfied during 1913	...	49	8,261	...	157	4,702	...	1,359	4,316	...	46	...	...	39	395					
" Cancelled "	3	130	...	70	1,484	...	280	647	...	60	...	...	6	597					
" Remaining Unsatisfied on 31st December, 1913	50	9,380	...	218	3,779	...	8,100	21,776	...	12	...	...	78	112,991					
Total agreeing with total above	...	102	17,771	...	445	9,965	...	9,739	26,739	...	118	...	...	123	113,983					
DETAILS. UNSATISFIED REQUISITIONS.																				
Awaiting Survey or Demarcation In Hand	15	226	...	179	2,906	...	6,790	17,253	...	2	...	...	43	88,837 ^a					
Demarcation awaiting circuit In Land Office for Settlement	7	141	...	10	263	...	532	1,885	...	...	...	...	7	151					
In S. O. awaiting Settlement of Queries	...	17	8,598	...	...	...	...	180	559	...	3	...	...	...	...	
" Drafting, etc.	...	8	330	...	9	125	...	144	441	...	1	...	...	6	20,625					
" In Hand	...	3	85	...	20	485	...	454	1,638	...	6	...	...	22	3,378					
Total Unsatisfied Requisitions	50	9,380	...	218	3,779	...	8,100	21,776	...	12	...	...	78	112,991					

NOTE.—A Requisition is "satisfied" when the work of the Survey Department is so far completed that titles can be supplied when demanded.
 (a) Includes seven Forests Reserves of 88,397 acres.

APPENDIX J.

RETURN SHOWING EFFECTIVE STRENGTH OF REVENUE SURVEY BRANCH 1913.

Personnel.	Perak.		Selangor.		Negri-Sembilan.		Pahang.		Federated Malay States.	
	Establishment.	Effective.	Establishment.	Effective.	Establishment.	Effective.	Establishment.	Effective.	Establishment.	Effective.
ADMINISTRATIVE.										
Superintendents	1	1	1	1	1	1	1	1	4	4
Deputy Superintendents	1	1	1	1	1	1	1	1	1	1
Clerks I	2	2	1	1	2	1.7	1	0.5	6	5.2
" II	2	2	2	2	2	2	2	1.7	8	7.7
" III										
FIELD.										
Assistant Superintendents	5	4.9	4	3.8	4	4	3	2	16	14.7
Surveyors I (and Surveyors on agreement)	12	6.5	6	4.4	9	5.8	4	3.7	31	20.4
" II	1	0.4	2	2.1	2	0.9	1	0.9	6	4.2
Surveyor Probationers	1	1.4	1	1.4	2	0.8	1	1	5	4.6
Assistant Surveyors (Special Class)	1	...	...	...	2	1	2	...	5	1
" I	6	2.9	7	3.9	3	1	1	1	17	8.8
" II	6	5.3	6	1.4	5	1.2	2	1.9	19	9.8
" III	12	17.3	15	8.9	15	11.4	8	6.2	50	43.8
Probationers	...	...	2	2	5	1.7	2	1.3	9	5
Mandors (Special Class)	2	2.5	1	...	1	...	1	0.9	5	3.4
OFFICE.										
Assistant Superintendents (Office)	2	1.9	1	0.9	1	1	1	0.9	5	4.7
Draftsmen Special Class	1	0.4	1	...	1	...	1	...	4	0.4
Draftsmen I	7	6.6	5	4.6	5	3.3	2	1.2	19	15.4
" II	7	3.4	6	5.8	6	1	3	1	22	11.2
" III	15	13.9	8	6.1	12	11.1	6	3.6	41	34.7
" IV	35	31.6	31	20.3	41	21.6	15	13.5	122	87
Probationers	15	15.2	20	15.9	25	16.4	15	5.5	75	53
Tracers and Typers	12	9.4	12	12.9	25	18.4	12	11	61	51.7