

## FEDERATED MALAY STATES.

### REPORT ON THE SURVEY DEPARTMENT FOR THE YEAR 1924.

The cost of the Survey Department for 1924 is summarised as follows:

	Gross Expenditure.	Reimbursement and Revenue.	Nett Expenditure.
Revenue Account ... ..	\$1,295,741	\$372,235	\$ 923,506
Capital Account ... ..	246,893	96,195	150,698
Total ... ..	\$1,542,634	\$468,430	\$1,074,204

The figures for 1923 were ... \$1,515,779 ... \$309,749 ... \$1,206,030

Of the reimbursements, a proportion of the amounts due for leave salaries and part of the cost of the topographical work in Johore, are still outstanding.

The amount recovered in survey fees was \$196,247 on an expenditure of \$880,050 but this does not in any way represent the value of survey work done. In addition to the fees recovered \$109,660 worth of work was done for other Government departments. In 1922 a new schedule of survey fees was approved by the Government. If the value of the Revenue Survey work had been assessed according to this schedule the fees earned aggregate very nearly \$500,000. This forms a much truer estimate of the efficiency of the department than the amount of fees recovered, as remission of survey fees by Residents and Collectors, and work done free for other departments, are variable quantities which produce no cash equivalent.

The details of expenditure of Revenue and Capital accounts are shown in Tables I and II and the distribution of expenditure in Table III.

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

	Estimated, 1924.		Expenditure, 1924.	
	Details.	Totals.	Details.	Totals.
	\$	\$	\$	\$
Personal Emoluments ... ..	...	939,977	...	864,832
Other Charges.—				
<i>Annually Recurrent.</i> —				
Allowances: Bicycle and Motor				
Cycle ... ..	20,000	...	7,108	
Allowances: Field and Transport				
Expenses ... ..	90,000	...	61,442	
Contingencies ... ..	4,600	...	4,062	
Contribution to Telephone Exchange	1,000	...	813	
Expenses of Officers on Transfer ...	5,000	...	2,633	
Instruments and Materials ... ..	25,000	...	29,627	
Maintenance of Boats ... ..	1,000	...	506	
Supply of Electric Current ... ..	3,000	...	2,303	
Survey and Demarcation Expenses	250,000	399,600	171,767	280,261
	...	1,339,577		
Special Expenditure.—				
Office Furniture—Surveyor-General's				
Office ... ..	200	...	149	
Typewriter ... ..	175	375	175	324
Temporary Allowance ... ..	...	...	...	118,542
Clerical Service ... ..	...	31,955	28,840	
Temporary Allowance ... ..	...	...	2,942	31,782
GRAND TOTAL ... ..	...	...	...	1,295,741



TABLE II.  
CAPITAL ACCOUNT.  
COMPARATIVE RETURN OF SURVEY EXPENDITURE.  
ACTUAL AND ESTIMATED.

	Estimated, 1924.		Expenditure, 1924.	
	Details.	Totals.	Details.	Totals.
	\$	\$	\$	\$
Personal Emoluments ... ..	...	112,041	...	76,493
Other Charges.—				
<i>Annually Recurrent.</i> —				
Allowances : Bicycles and Motor Cycles ...	5,280	...	1,580	
"    Field and Transport Expenses	30,000	...	37,007	
Contingent Expenses ... ..	800	...	1,073	
Contribution to Telephone Exchange ...	...	...	120	120
Instruments and Materials ... ..	5,000	...	6,859	
Survey and Demarcation Expenses ...	50,000	91,080	109,832	156,351
Total ...	...	203,121	...	232,964
Temporary Allowance ... ..	...	14,026	...	9,574
Clerical Service ... ..	...	5,000	3,980	
Temporary Allowance ... ..	...	375	375	4,355
GRAND TOTAL ...	...	222,522 *	...	246,892

\* Supplemented by payments from Unfederated States.

TABLE III.  
DISTRIBUTION OF EXPENDITURE.

	Total Expenditure.		Reimbursement and Revenue.		Nett Expenditure.	
	\$	\$	\$	\$	\$	\$
Surveyor-General's Office ...	65,074	...	19,346	...	45,728	
Central Drawing Office ...	44,101	...	55,148	...	43,504	
Photo-litho. Section ...	54,551	...	...	...	...	
Instrument Repairing Section	15,049	...	3,214	...	11,835	
Officers on leave ... ..	141,549	...	53,469	...	88,080	
Transfer of Officers ... ..	2,633	...	...	...	2,633	
Salaries paid for Government Town Planner ... ..	12,406	335,363	...	131,177	12,406	204,186
Trigonometrical Survey Branch ... ..	...	80,328	...	44,811	...	35,517
Topographical Survey Branch	...	246,893	...	96,195	...	150,698
Revenue Survey Branch—						
Perak Division ... ..	355,640	...	86,936	...	268,704	
Selangor Division ... ..	173,055	...	44,600	...	128,455	
Negri Sembilan Division ...	158,100	...	38,772	...	119,328	
Pahang Division ... ..	193,255	880,050	25,939	196,247	167,316	683,803
Totals ...	...	1,542,634	468,430	...	...	1,074,204



## CENTRAL DRAWING OFFICE.

The effective strength of this branch was 43, under the control of Mr. E. Shadgett, Chief Draftsman.

The scope of the work undertaken is very much the same year by year, the topographical drawing requiring great skill in draftsmanship. Among the principal maps drawn or completed during the year may be mentioned the 4-inch to a mile topographical map of Singapore Island and parts of the standard topographical sheets  $2 \frac{N}{10}$  and  $2 \frac{N}{14}$ .

The field sheets of 1924 surveys have now arrived and the drawing of these two sheets will be completed in 1925.

The general map of British Malaya on a scale of 6 miles to an inch was completely revised and brought up to date.

The various classes of work were embodied in 427 requisitions, an increase of 61 over 1923, and are referred to again in connection with the Photo-Litho Branch.

## PHOTO-LITHO SECTION.

Mr. W. D. Mavor, Chief Photo-Lithographer, was in charge until he proceeded on leave in May.

Mr. W. H. Noble, who returned from leave in April, was in charge from May till the end of the year.

The demand for the services of the map-producing branch, that is the work of the Central Drawing Office and of the Photo-Litho Department, continues to increase and many requisitions for work not only for other Government departments but also from the public have to be refused owing to the fact that everything must be subordinated to the "legitimate" work, the printing of maps, the demand for which is greater than ever before.

The most notable map produced during the year was the 4-inch to a mile map of Singapore Island and its adjacent islands.

The quality of the work and the appearance of this map reflects the greatest credit on the drafting and printing staff and is in every way worthy of a first-class map producing office. It may be said that all the work produced is of very high quality and it is the more gratifying as it is all done by local youths trained and supervised by European officers.

The productions for the year include:

Reconnaissance maps of Kemaman and Pekan-Kuantan areas.

Twenty inches to a mile maps of Singapore for the Improvement Trust.

Two editions of the general map of British Malaya 6 miles to an inch.

An 8-mile to an inch map of British Malaya showing alienated land.

Mukim maps of Kedah.

A map of Johore Bahru 20 inches to a mile.

Revised editions of the district maps of Selangor.

Revised editions of the Selangor State Map.

Taiping and environs 20 inches to a mile.

Four hundred and eighty-seven revenue survey 8-chain standard sheets.

An interesting experiment was the reproduction and reduction to scale of the photographs taken from the air by the Air Force officers of H.M.S. "Pegasus."

The number of requisitions dealt with was the same as for the Central Drawing Office, viz.: 427, an increase of 63 over last year.

The number of copies of maps or other documents produced necessarily shows a decrease owing to the stoppage of the printing of rubber coupons.

The number of copies produced was ... ..	258,543
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The number of negatives taken ... ..	405
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The number of helios and vandykes made ... ..	1,677
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The total value of which was \$75,061.	
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## INSTRUMENT MAKING AND REPAIRING SECTION.

Mr. Austen was on leave from February to December and during his absence the section was controlled by Mr. J. Dewar of the head-quarters staff. Mr. Dewar instructed the Foreman, Mr. Ho Ah Peng, who actually supervised the mechanical work. Mr. Frodsham of the Revenue Branch, Selangor, examined and adjusted instruments after repairs.



The remarks made on this section in the 1922 report still hold good.

The value of the department is much greater than the comparison of revenue and expenditure can show because the indirect saving to the Government by prolonging the life of instruments is very large and in addition a great many of the less complicated instruments are made of superior workmanship and at less cost than they can be purchased in England.

This section also shows how local youths can be taught to be efficient at a skilled trade if they are properly supervised.

#### TRIGONOMETRICAL BRANCH.

Very little trigonometrical work was done in the Federated Malay States during the year. In the early part of the year Mr. Dunn did some secondary triangulation in north-west Pahang principally to fix control points for future topographical work.

Mr. Neil continued, as part time work, the reconnaissance survey of southern Trengganu. He was assisted by Malay mandors. The work was carried up to Merchang where it will stop for the present. The results of the work of the past two years will give a good working map of the south part of Trengganu.

Capt. Best was engaged on the observation of the angles of the main triangulation of Trengganu and completed the work in one season.

He occupied 16 points and fixed 24 points and in addition furnished a great deal of useful information on the topography of the State.

A sketch map is in course of preparation, compiled from the work of Mr. Spowers and Capt. Best, so that in addition to the reconnaissance map of the southern portion, a sketch map of the northern portion of the State will soon be available on which will be included the information obtained by Trengganu officers in the course of their journeys and explorations. The large programme successfully carried through by Capt. Best reflects very great credit on this officer and the Trengganu Government has expressed great appreciation of this and the additional information he has been able to furnish.

#### TOPOGRAPHICAL BRANCH.

Mr. J. N. Sheffield, Assistant Surveyor-General, Topography.

#### FIELD WORK: OUTTURN.

STANDARD SHEETS  $2 \frac{N}{10}$ ,  $2 \frac{N}{14}$ ,  $2 \frac{N}{15}$  AND  $3 \frac{B}{3}$ , PERAK AND PAHANG.

The survey of these sheets was proceeded with throughout the year, Mr. A. C. Twyford, Assistant Superintendent, Topographical Surveys, being the officer-in-charge. The area surveyed covered the very big country of the main range lying between Gunong Batu Puteh, 6,987 feet in the north and Gunong Ulu Liang, 6,335 feet in the south, mostly on the Perak side.

Towards the end of February, four hill clearing parties were despatched to the area comprising Ulu Batang Padang, Ulu Brusih, Ulu Sungkei and Ulu Slim. The number of these parties was increased to 9 during April, May and June, afterwards being gradually reduced as the number of hill stations became sufficient, until in August only 2 remained in the field. In all 50 points were cleared in the Perak area, 27 of which were fixed by theodolite and 23 by plane-table fixation to act as hill stations for sketching and traverse control.

The triangulation was carried out by Major W. A. D. Edwardes, Acting Superintendent, Mr. C. E. L. Roberts, Surveyor on Agreement, and Mr. V. Thampipillai, Technical Subordinate II.

In the Pahang area, comprising the Ulu Telom and Ulu Bertam, 19 points were cleared, 15 of which were fixed by theodolite, the triangulation being carried out by Mr. C. J. Dunn, Surveyor on Agreement. This work was commenced at the beginning of March and was terminated towards the end of June, when Mr. Dunn went on leave.

Plane-tabling operations commenced early in April, when 13 plane-tablers in sub-charge of three senior subordinates took the field over an area of 320 square miles. Of these, four (later on increased to five) were in charge of Mr. V. Thampipillai, Technical Subordinate II, on the Ulu Sungkei area, Sheets  $2 \frac{N}{14}$  and  $2 \frac{N}{15}$ , five were under Inche Mohd. Sheriff, Technical Subordinate II, on the Ulu Batang Padang and Ulu Brusih area and four were under the supervision of (the late) Mr. S. Subramaniam, Technical Subordinate III, completing the eastern portion of sheet  $2 \frac{N}{10}$  Pahang.

At the beginning of May six more plane-tablers were despatched to the Ulu Slim and Ulu Liang area, sheets  $2 \frac{N}{15}$  and  $3 \frac{B}{3}$  and in June Inche Buyong, Technical Subordinate III, was placed in charge of them.



At this time there were 20 plane-tablers in the field, four senior subordinates assisting also with the plane-tabling and nine clearing parties, making a total of 33 and it is a matter for serious consideration whether the facilities for supervision of their work, transport and supplies did not fall far short of being adequate to ensure proper working economy. The scarcity of senior subordinates in the branch, Grade II men of strong physique is responsible for a situation in the field very difficult to deal with.

There is one phase of the question, perhaps not realised sufficiently, which should receive attention when forming a critical opinion upon the efficiency of parties working at these high elevations for a prolonged period. It is that young plane-tablers (especially Tamils) working month after month away back in the very big and imposing (the description "awesome" is hardly an exaggeration) country of these large jungle clad Ulu, often under depressing conditions of climate and health, require not only technical advice but the moral support afforded by frequent visits of the officer-in-charge, or failing him, some responsible senior subordinate officer of long jungle experience—without this there would seem to be evidence that they are apt to "lose their heads" and the power of thinking for themselves, which they actually do possess in normal circumstances. The ability to direct others can only mature by time and experience, assisted, of course, by natural aptitude.

The party under Mr. V. Thampipillai completed its area in the middle of September; this was subsequently examined by Mr. Twyford and his report on it is a very good one. He credits Mr. Thampipillai with being an officer capable of taking charge of a party very efficiently.

The party in charge of Inche Mohd. Sheriff also completed its field work in September but a good deal of "finishing up" was delayed as Mohd. Sheriff's services were utilised in checking one of the Pahang sections. Mr. Twyford speaks very highly of this officer's work in the Ulu Sungkei area, "an excellent job in a very difficult and mixed class of country."

It should be noted that Mr. V. Thampipillai and Inche Mohd. Sheriff were the only two officers on this survey who could be classed as senior subordinates for the purpose of a 1-inch programme.

The total area completed on this survey was 438.7 square miles.

The cost of the triangulation by Mr. Dunn in Pahang has not been included in this report.

The outturn per plane-tablet on the survey was small and the cost of transport and supplies larger than was expected.

It is recognised that efforts must be made to effect some material improvement in both these respects on this class of work. It is hoped that on a future 1-inch programme it will be possible to have sufficient triangulation completed over the whole area before the plane-tablers take the field. This will enable the Assistant Superintendent in charge to devote the whole of his time at the commencement of the survey to seeing the plane-tablers workably established on their sections and to supervise the arrangements for the transport of supplies which for such a large party is a matter requiring skilled organisation, if it is to work economically.

## 2.—STANDARD SHEET 3 $\frac{1}{4}$ JOHORE.

The work on this sheet was in charge of Capt. G. H. Sworder, Assistant Superintendent, Topographical Surveys. During January and February he was engaged on topographical triangulation and control traversing, seven theodolite fixations with heights were made on the sheet itself and later in the year a further nine points were similarly fixed outside the western and northern margins for use partly on sheet 3  $\frac{1}{4}$  and partly in view of the probable extension of the survey into sheets 3  $\frac{1}{3}$  and 3  $\frac{H}{16}$ . Many of these points were fixed with the accuracy of secondary triangulation for use by the Revenue Survey Branch. Two of the more senior plane-tablers assisted in the preliminary work by running 40 miles of control lines across the sheet before actual plane-tabling was commenced. Other control work by Capt. Sworder during the ensuing months, included 51 miles of traversing with 97 clino heights. Eight plane-tablers got to work early in March; of these four were Malays and two were Tamils. One of the latter went sick after five months in the field and was still under treatment in hospital at the end of the year. In other respects the health of the party was good, and all things considered, their output of a little over four square miles per man per month must be considered a satisfactory outturn in the broken country they were working in, where the height and formation of the higher hills permitted of little reliable sketching being done. About 30 per cent. of the area was covered with a high and thick growth of resam fern, a great obstacle to rapid movement. In the course of the survey 1,567 miles of traverses were run by the plane-tablers and 12,836 clinometer heights were determined.



The cost of this survey worked out to more than was anticipated, partly owing to the difficulty of effecting a change to small scale methods by plane-tablers who had been working for the previous two seasons on a scale four times as large and in some cases on town planning scales. In addition the rate of coolies wages was at least 15 per cent. in excess of that which would have been paid on similar conditions of ground in any of the Federated States, whilst the cost of putting a plane-tabling party in the field in comparatively new country, a long distance from head-quarters, is a factor that should not be ignored in making future estimates. Capt. Sworder's duties were somewhat divided throughout the year, as in addition to supervising the work of his party, he also kept in touch with the officer-in-charge of the Colonial Survey Section working on his eastern and southern margins holding himself in readiness, with his better knowledge of local conditions, to render any assistance he could from time to time, and he acted as liaison officer with the Air Force of H.M.S. "Pegasus" who were engaged for some months in photographing parts of Johore from the air for survey purposes.

### 3.—PENANG HILLS SURVEY.

The survey on a scale of  $10''=1$  mile, vertical interval 20 feet, of an area of 8.43 square miles in the Ayer Itam district and contiguous to that surveyed in 1920-1921, was undertaken in connection with the Penang Hills development scheme and the operations were in charge of Mr. H. C. Abraham, Assistant Superintendent, Topographical Surveys.

Topographical triangulation was carried out during March by Messrs. Aylward and Roberts, Surveyors on Agreement, under the direction of the Acting Superintendent, Topo., for which purpose it was also found necessary to re-determine the position of some of the existing trigs. This work was based on Government Hill and Elvira Trigs. and subsequent to this 11 topographical stations were established.

Plane-tabling commenced in May when five parties took the field and towards the end of August two more plane-tablers who has finished their sections on the 1-inch survey, Federated Malay States, were added to the party. In the course of the survey 332.6 miles of traverses were run containing 9,729 clinometer heights.

The control and checking work, in addition to the preliminary work mentioned above comprised eight theodolite fixations with heights, 6.4 miles of spirit levelling establishing 37 bench marks, and 8.54 miles of traversing, with 599 clinometer heights.

With the exception of a small area along the E. and N. E. margin the ground surveyed was very steep and rough, consisting of hill slopes cut up by steep gullies, their dry beds being in most cases completely filled with large boulders, whilst in the crevices between them water could be heard flowing at some depth below.

The ground for the most part was covered with jungle and blukar the latter being chiefly resam fern a particularly troublesome type of undergrowth to get through, rendering movement from point to point on the hill sides at times a very slow and strenuous business. The health of the party was good, which no doubt accounts for the very creditable outturn and the fact that the cost rate per square mile shews a great reduction on that of the previous survey. The whole party consisting of five Tamil and two Malay plane-tablers was back at head-quarters by December 10.

### 4.—FOREST RESERVE SURVEYS.

#### PARIT RESERVE—PERAK.

This was the only Forest Reserve Survey (scale  $4''=1$  mile, vertical interval 25 feet) undertaken by the branch during the year. A commencement was made in August, the plane-tablers detailed for the work having been withdrawn from the 1-inch survey on completion of their sections. Mr. H. C. Abraham, Assistant Superintendent, Topographical Surveys, was in charge of the survey, and Inche Mohd. Ariffin, Technical Subordinate II, was in sub-charge of the plane-table party.

The total area of the reserve is 37.155 square miles, of which 14.11 square miles were completed by the end of the year (December 15th).

During August and September control points consisting of 17 theodolites fixations with heights were established by the Acting Superintendent, Topo., latterly assisted by Inche Mohd. Ariffin, who in addition, carried out further control work during September, October and November. This work consisted of 14 miles of spirit levelling and 25.3 miles of traversing with 556 clinometer heights.

The first three plane-tablers took the field in the middle of September and this number was gradually augmented until by December the party consisted of seven. During September and October the plane-tablers were chiefly engaged in running traverses between control points to act as a framework on which to build the filling in and in the course of this 171 miles of traverses were run and 3,029 clinometer heights recorded.



On account of this the actual area return at the end of the year was smaller than it otherwise would have been, but the usefulness of the method should make itself felt as the survey progresses and in the accuracy of the final result.

The southern portion (about half the total area) of the reserve is swampy, in some places very deep, whilst the northern portion is hilly, the highest point being about 850 feet.

It is expected that the survey will be completed about the end of February, 1925.

#### 5.—TOWN PLAN SURVEYS.

In Kuala Lumpur, town plan surveys on a scale of  $80''=1$  mile were proceeded with throughout the year. The area surveyed was 2.031 square miles comprising G.T.P. Schemes 1, 2, 7, 16, 18, 24 and 27.

In February, Inche Mohd. Ariffin bin Daud, Technical Subordinate II, was placed in charge of this party and remained so until the middle of August, when he had to be withdrawn to assist in supervising the Parit Forest Reserve, Perak. Inche Zakaria bin Basah, Technical Subordinate III, then assumed charge of the survey until the end of the year. The plane-tablers engaged on this work at the beginning of the year were two Technical Subordinates Grade II, one Technical Subordinate Grade III and three Junior Technical Subordinates.

At the beginning of July one Grade II plane-tabler and one Junior Technical Subordinate were transferred to the Revenue Survey and were employed on the Seremban Town Survey until the end of the year.

In July, at the instance of the State Engineer, Selangor, an area of 0.109 square mile was surveyed to the same scale, in connection with the High Street and Petaling Street Drainage Scheme. The cost rate for this large scale work shews a sensible reduction for the year.

At Ipoh, town plan surveys on a scale of  $40''=1$  mile were carried out by Mr. P. Cordner-James up to the end of March and then by Mr. V. Muttiah, Technical Subordinate III, up to the end of the year. This work really amounted to a re-survey of detail, necessitated by circumstances explained in my annual report for 1923.

An area of 2.101 square miles was thus surveyed in connection with town planning schemes in the vicinity of Menglembu Road, Gopeng Road, Selebin Sei Pari and Tambun Roads and Pasir Puteh.

#### 6.—MISCELLANEOUS SURVEYS.

During March and April a survey of an area of 2.5 square miles at Port Dickson was taken in hand in connection with a camp site and manœuvring ground for the M.S.V.R. The survey on a scale of  $10''=1$  mile, vertical interval 20 feet, was carried out by two young plane-tablers under training who turned out some very good work, supervised by the Acting Superintendent and Inche Mohd. Ariffin, Technical Subordinate II.

At Ulu Langat a survey was carried out for the purpose of a proposed hydro-electric power scheme for the Sungei Besi mines. It was commenced at the end of February and occupied one Grade III plane-tabler  $2\frac{1}{2}$  months. The survey consisted of locating 20 feet contours along two belts of ground each of a vertical depth of 120 feet at elevations of 1,300 feet and 1,800 feet, respectively, and connecting to the three principal streams where gauging operations were in progress. In the course of the survey 25.2 miles of traversing were run and 845 clinometer heights determined. The work which was plotted on a scale of  $4''=1$  mile was fully recorded in field books, which was handed over to the company concerned. The accuracy of the work was such as to justify the enlargement of the resulting map to a scale of 200 feet to the inch the scale on which the company required the final plan. The work was supervised by the Acting Superintendent and Inche Mohd. Ariffin and the cost was reasonable.

#### 7.—REVISION SURVEYS.

##### STANDARD SHEET 2 $\frac{M}{4}$ PERAK.

This sheet was originally mapped in 1910 and was the first to be undertaken after the inauguration of the Topographical Branch. The survey was somewhat in the nature of an experiment, as it was desired to see how far the methods in use in other countries, such as India, could be applied to the Federated Malay States and whether anything like a similar rate of progress in the field could be hoped for. The result of the survey definitely proved that this could not be expected and that to a great extent we should have to evolve methods of our own for dealing with country covered for the most part with high and exceptionally dense jungle. It is a matter for regret that this fact was not recognised sooner as it is probable that other sheets have suffered in parts from the attempt to imitate methods of survey suitable only to very much more open country.



The present revision or to a great extent re-survey of this sheet was commenced in July and has been carried out by probationers under training, all of whom were in charge of Mr. A. Sanmugam, Technical Subordinate I.

From a consideration of field reports there is good reason for coming to the conclusion that more training (subsequent to the training at head-quarters) under actual jungle conditions should be given to the young plane-table before he is posted to a regular plane-table party working for progress and sheet 2  $\frac{M}{4}$  has provided a very suitable training ground in this respect, being also within convenient distance of head-quarters.

The area covered by this party of probationers on sheet 2  $\frac{M}{4}$  was 97 square miles and with the painstaking supervision they received, a very reliable map has been produced.

In June, some preliminary triangulation was carried out by Major Edwardes and Messrs. Abraham and Roberts, after which plane-tableing commenced.

The probationers, sixteen in number, with two exceptions, were Malays of the class from which mandors are usually recruited and three of them worked in conjunction on one plane-table. It is thought that in future two to a plane-table will be a better allotment. As the result of the training received on this survey twelve of these probationers will shortly be ready to take their place in regular field parties and the cost which worked out at \$132 per square mile may be considered as money for which good value has been received.

#### NOTES ON TRAINING.

Early in January Messrs. C. E. L. Roberts and W. P. Aylward, Surveyors on Agreement, reported for duty at head-quarters, Taiping, and underwent a short course of plane-tableing during February and March under the direction of the Superintendent, Topographical Surveys. At the end of March they commenced a course of instruction in secondary and topographical triangulation supervised by Major Edwardes. Mr. Roberts' services in this respect were subsequently utilised on the Penang survey, the one inch survey, Perak, and on the revision of Sheet 2  $\frac{M}{4}$ . In June the requirements of the Revenue Survey necessitated his withdrawal from the branch. Mr. Aylward was also employed on the preliminary work of the Penang survey during March and April, when he too had to relinquish his work with the branch owing to ill-health. It was disappointing that the services of both these officers should have been lost to us at that time.

The training of probationers at head-quarters was, as usual, carried out by Mr. A. Sanmugam, Technical Subordinate I, and at the beginning of the year there were 21 under his charge, one more joining in the middle of February.

After receiving a certain amount of preliminary instruction four of these were deemed unsuitable for further training as plane-tableers and they reverted to their former posts as mandors. One was rejected on a medical certificate, one Junior Technical Subordinate who was undergoing further training, resigned and one was posted to a 1-inch field party where he seems to have put up a satisfactory record.

In July, the training party, now numbering 14, were transferred to the Kuala Kangsar district where they worked on the Revision Survey of Sheet 2  $\frac{M}{4}$  until the end of the year.

In February, six Technical Subordinates III sat for the First Technical Examination set by the Superintendent, Topographical Surveys, assisted by Mr. Sanmugam and one more took the examination in December.

#### OFFICE.

The Drawing Office staff were employed on the usual routine work of scoring and plotting plane-tables for the field, "finishing up" plane-tables received from the field and in the preparation of the monthly progress diagrams and records. The number of plane-tables scored ready for the field during the year was 137, much the greater proportion of them being for town plan surveys. The work of finishing up the town plans, i.e., putting them into shape for photo reproduction direct from the field sheets kept the staff fully occupied.

One draftsman, Grade III, was loaned to Messrs. Sir W. G. Armstrong, Whitworth & Co., Ltd., Kuala Kangsar, for the greater part of the year.

A great improvement was effected in the Drawing Office building by the conversion of the end verandah into an extension of the drafting room. Even now, in recess time, the Drawing Office is apt to be uncomfortably crowded.



## EFFECTIVE STRENGTH.

Mr. J. N. Sheffield, Assistant Surveyor-General, Topography, went on long leave in the middle of March, and Major W. A. D. Edwardes, who had been transferred to the branch from 1st January, 1924, acted as Superintendent until the former's return on December 15.

Mr. P. Cordner-James completed his period of service with the branch on March 31. Mr. H. C. Abraham, Assistant Superintendent, Topographical Surveys, returned from long leave on 25th April, 1924, and Mr. A. C. Twyford, Assistant Superintendent, Topographical Surveys, went on long leave on 24th November, 1924. Capt. G. H. Sworder was temporarily transferred to the Trigonometrical Branch on May 1. At the beginning of the year Messrs. C. E. L. Roberts and W. P. Aylward were attached to the branch for training but after about five months' work they were both re-transferred, as reported elsewhere.

The subordinate staff suffered several losses during the year and it is with regret that I have to record the death of Mr. S. Subramaniam, Technical Subordinate III, on September 17th. He had been in charge of a plane-tabling party on the 1-inch survey in Pahang.

Mr. M. Chinniah, Technical Subordinate II, whose health broke down on the 1-inch survey 1923 was retired on a medical certificate in June. The retirement of this hard working and conscientious officer was a serious loss to the senior subordinate staff, which is much below strength at present.

Inche Gusti bin Wahid, a promising young plane-tableer also had to be retired on a medical certificate at the end of the year. In July, Inche Gusti who was working on the 1" survey Perak, sustained serious injury through a fall into a river and this unfortunately seems to have permanently affected his health.

Three Junior Technical Subordinates resigned their appointments, viz.: Mr. B. Nicholaspillai on 16th February, 1924, Inche Mat Din bin Khatib Senor on 1st February, 1924, and Inche Suman bin Malek on 1st October, 1924. The services of Mr. Awater Singh, Junior Technical Subordinate, were dispensed with on 15th March, 1924.

The effective strength of the branch was 93 per cent., the same as in 1923.

The following table shows the details of field work on the various scales with the cost rates. In some cases where the area is very small or the survey incomplete, the cost rate and monthly outturn cannot be properly computed and they have accordingly been omitted.

## STATEMENT SHOWING DETAILS OF FIELD WORK, COST RATES, ETC., 1924.

NOTE.—The field costs given below include all Drawing Office costs of finishing up plane-tables at Head-quarters, Taiping.

State.	District.	Description of Survey.	Area completed.	Average monthly outturn Plane-tableer.	Total expenditure.	Cost rate per square mile.
			Sq. Mls.	Sq. Mls.	\$	\$
SCALE, 1" = 1 MILE.						
Perak	Batang Padang	Standard Sheets 2 $\frac{N}{14}$ , 2 $\frac{N}{15}$ and 3 $\frac{B}{3}$	367.4			
..	Kinta	Standard Sheet 2 $\frac{N}{10}$ ... ..	7.0			
Pahang	Kuala Lipis	" " 2 $\frac{N}{10}$ ... ..	64.3			
			438.7	3.0	89,034	203 <i>a</i>
Johore	Kota Tinggi	" " 3 $\frac{L}{4}$ ... ..	298.5	4.3	38,506	129
SCALE, 10" = 1 MILE.						
Penang	Ayer Itam	Penang Hills. Vertical Interval 20 feet ... ..	8.43	0.22	15,650	1,856

*a.* Cost of triangulation by Mr. Dunn in Pahang not included.



## STATEMENT SHOWING DETAILS OF FIELD WORK, COST RATES, ETC., 1924—(cont.)

State.	District.	Description of Survey.	Area completed.	Average monthly outturn Plane-table.	Total expenditure.	Cost rate per square mile.
		FOREST RESERVE SURVEYS. SCALE, 4" = 1 MILE, VERTICAL INTERVAL 25 FEET.	Sq. Mls.	Sq. Mls.	\$	\$
Perak	Kuala Kangsar	Parit Reserve ... ..	14.11	...	9,846	
		TOWN PLAN SURVEYS. SCALE, 80" = 1 MILE, VERTICAL INTERVAL 5 FEET.				
Selangor	Kuala Lumpur	Kuala Lumpur Town— G.T.P. Scheme No. 18 ...	0.373			
		" " 27 ...	0.382			
		" " 24 ...	0.861			
		" " 16 ...	0.079			
		" " 7 ...	0.076			
		" " 1 and 2 ...	0.086			
		" " 2 and 16 ...	0.068			
		" " 1 and 7 ...	0.064			
		Outside Margins ... ..	0.042			
			2.031	0.041	15,617	7,689
Selangor	Kuala Lumpur	Kuala Lumpur Drainage Scheme	0.109	...	734	
		SCALE, 40" = 1 MILE, IPOH TOWN DETAIL SURVEY.				
Perak	Kinta ...	Menglembu Road Area ... ..	0.161			
		Gopeng Road " ... ..	0.407			
		Pasir Puteh " ... ..	0.289			
		Selibin, Sei Pari Road ... ..	0.845			
		Tiger Lane and Tambun Road ...	0.399			
			2.101	0.183	6,422	3,057
		MISCELLANEOUS SURVEYS.				
Selangor	...	Port Dickson M.S.V.R. Camp, Scale, 10" = 1 mile, Vertical Interval 20 feet ... ..	2.5	0.407	1,786	714
"	...	Ulu Langat H. E. Scheme ...	...	...	1,132	
Perak	Kuala Kangsar	REVISION AND TRAINING. Standard Sheet 2 $\frac{M}{4}$ ... ..	97.5	...	12,893	132

## REVENUE SURVEYS.

The complete report, with detailed tabulated statements, has been presented to the British Resident of each State.

The following extracts are taken from those reports:

## PERAK.

Mr. W. A. Wallace, Superintendent.

The total expenditure was \$355,640 as compared with \$372,588.

2. The nett cost of the branch for 1924 was \$268,704 as compared with \$318,459 in 1923.

3. The revenue collected was \$86,936 as compared with \$54,129 in 1923.



4. The cost of work done for other departments was \$20,980 as against \$15,731 in 1923.

5. Value of work done on the scheduled scale of survey fees amounted to about \$200,000.

6. The sale of maps, etc., for Surveyor-General's Litho Department amounted to \$3,785 as against \$2,167 in 1923. In addition \$2,818 worth were supplied free to Land Offices, District Officers and District Surveyors, etc., which when added gives a total of \$6,603.

#### OUTTURN AND COST.

7. The actual field expenditure was \$117,531 as compared with \$140,060 in 1923. In all 3,636 lots were surveyed, 19,294 acres and 129,568 chains. In 1923 these figures were lots 4,037, acres 27,477, chains 159,874.

The cost per chain was \$0.88 as against \$0.87 in 1923.

The cost per acre of mining, agricultural and small holding applications was \$2.32, \$1.77 and \$4.00 as compared with \$2.00, \$1.56 and \$5.55 in 1923.

#### OFFICE.

8. The number of documents of title, etc., prepared was 10,008 compared with 12,122 in 1923. The 1923 figures were a record for this branch.

*Survey Fees, etc.*—The cost of the branch was \$19,043 less but the revenue was \$32,807 more than in 1923. This is satisfactory in view of the fact that the work of this branch has been for the most part the clearing up of old unsatisfied requisitions for demarcation previous to December, 1922; fees for which had been collected under the old system and credited to revenue to requisition.

*Town Detail Sheets.*—Thirty-four 1-chain sheets were scored and outlined. For Telok Anson, 2; Sungkai, 2; Tapah, 6; Sungei Siput, 4; Kati, 1; and Salak and Simpang Villages, 2; all in duplicate.

Detail sheets of Kuala Kangsar town are now complete.

Five feet contour survey of two 1-chain sheets of Batu Gajah were completed.

#### PROGRESS re THE NEW 8-CHAIN AND 32-CHAIN SHEETS.

9. During the year 205 new 8-chain sheets were completed and 136 are in hand in various stages.

Twenty-five new 32-chain sheets were also completed and 8 are in hand.

#### REDRAFTS OF EXISTING TITLES.

The following redrafts were drawn during the year:

Grants (Country) ... ..	2
Certificate of Titles (Country) ... ..	62
Certificate of Titles (Town) ... ..	15
Mining Leases ... ..	25
Extracts Mukim Register ... ..	861
Miscellaneous Leases, Burial Licences, etc. ... ..	3
Total ... ..	968

The large number of extracts that come up for redraft is due to three causes (a) the use of too poor a paper, (b) lack of careful storage by the owners, and (c) the endorsements not being tabulated in printed form on the back the engrossing of which by hand soon fills the space available. Attention was drawn to this matter at the last Conference of Superintendents in Kuala Lumpur.

#### PROGRESS WITH REFERENCE TO REQUISITIONS.

10. On the 1st January, 1924, there were requisitions on the books for the survey of 7,911 lots, 2,781 were received during the year, making 10,692 to be dealt with. Of these 6,252 were satisfied and 173 cancelled. There remained on 31st December, 1924, 4,267 of which 972 awaited survey, 477 were at some stage in the office and 2,818 were with the Land Officers for settlement.



## PARTICULARS OF WORK.

11. Upper Perak and Kuala Kangsar are worked as one survey district. In this survey district there were, at the beginning of the year, 644 lots awaiting survey and at the end of the year 345 lots, as compared with 1,640 and 644 lots for the year 1923. In this district requisitions for the survey of 699 lots were received during the year. The District Surveyor writes: "The cost does not compare very favourably with that for 1923, but increases in salary, special surveys and Surveyors under training, to say nothing of the continual changes made in administration, probably account for the higher rate per chain and smaller output."

"Detail surveys of Kuala Kangsar and Sungei Siput townships and Salak North and Karai villages were made and plotted.

Unconnected lots in Kroh and Peng were circuited and a considerable amount of circuit of old series work was done in Senggang mukim and is still in hand."

12. *Lower Perak*.—At the beginning of the year there were 407 lots awaiting survey and at the end 226 lots as compared with 2,186 lots and 407 lots for the year 1923. Requisitions for the survey of 611 lots were received in 1924. The extension of 19,253 acres to the Kroh Forest Reserve was surveyed during the year and the field work and plotting of 15 one-chain sheets of Telok Anson town detail were completed.

13. Selama, Krian, Larut and Matang are worked as one survey district, under the District Surveyor, Taiping. In this survey district there were 222 lots awaiting survey on 1st January, 1924, and 201 on 31st December, 1924, as compared with 327 lots and 222 lots for 1923. Requisitions for 790 lots were received during the year.

The following are extracts from the District Surveyor's report: "There was also a number of requisitions in the township of Taiping which could not satisfactorily be dealt with until an alignment survey was put in hand. This I put in hand at once, devoting all my time to it between office and ordinary administration duties.

Good progress has been made in so far as the alignment of nearly all the streets has been decided upon and permanent marks inserted at suitable offsets. In addition to this the detail of five blocks has been completed. Three of these have been drawn up and a permanent record made of all detail as regards buildings, old boundary marks and old traverse marks. An alignment survey has also been started in the township of Bagan Serai and the detail of one block completed."

"Larut and Matang work has been brought up to date with the exception of a few requisitions received late in the year.

Selama work has been brought completely up to date, on 31st December, 1924, there were no further Selama R. Ss. in my file."

The District Surveyor also reports a decrease of \$2,547 in the gross cost of the district as compared with 1923, but an increase of 358 lots and 3,225 acres while the chainage has been decreased by 2,058 chains. Part of this reduced cost is due to the District Surveyor's expenditure being shared with Lower Perak and Kuala Kangsar during the three months when he had control of these districts.

14. *Kinta*.—At the beginning of the year there were 207 lots awaiting survey and at the end of the year 1923. Requisitions for the survey of 470 lots were received during the year.

Town alignment surveys with frame work with permanent marks at four corners parallel to original title boundaries for six sections of town lots in Kinta were carried out during the year:

2	sections in Ipoh
1	section in Gopeng
1	„      Kampar
1	„      Tanjong Rambutan
1	„      Tambun

Total ... 6

also the alignment of a total of another six sections of town lots in the Batang Padang towns of Tapah, Temoh and Chenderiang.



15. *Batang Padang*.—During the year the District Surveyor's duties were carried out by the Deputy Superintendent, Revenue Surveys, Kinta. At the beginning of the year there were 58 lots and at the end 59 lots awaiting survey as compared with 370 lots and 58 lots for the year 1923. Requisitions for the survey of 211 lots were received during the year.

Particulars *re* paragraphs 11 to 15 are tabulated below :

Survey District.	Lands District.	Lots awaiting survey.		Lots received for survey 1924.	
		1-1-24.	31-12-24.		
Taiping ... ..	{ Selama ... ..	98	1	115	
		Krian ... ..	19	93	123
		Larut and Matang ...	105	107	552
			222	201	790
Kuala Kangsar ... ..	{ Upper Perak... ..	451	237	429	
		Kuala Kangsar ...	193	108	270
			644	345	699
Kinta ... ..	Kinta... ..	207	141	470	
Batang Padang ... ..	Batang Padang ...	58	59	211	
Lower Perak ... ..	Lower Perak... ..	407	226	611	

(A lot is considered as awaiting survey until the field book has been received in head office.)

#### EFFECTIVE STRENGTH, ETC.

16. Mr. W. A. Wallace, Superintendent, was in charge throughout the year, Mr. C. A. Rust was Assistant Superintendent, Office, at Head Office up to the end of November, when he had to go on leave owing to ill-health; and during December Mr. P. H. Goss acted as Assistant Superintendent, Office, in addition to his own duties.

Mr. E. Aune was Deputy Superintendent, Revenue Surveys, at Kinta, from 1st January, 1924, to 21st June, 1924, and Mr. J. M. Favell from then to the end of the year, and Mr. A. C. Every was Assistant Superintendent, Kinta Office, from 1st January, 1924, to 1st May, 1924, when he went on leave prior to retirement; Mr. F. F. Byatt taking over his duties from 16th June, 1924, to the end of the year.

Mr. W. P. Aylward was District Surveyor, Taiping, from 1st January, 1924, to 17th January, 1924, and Mr. P. H. Goss was District Surveyor for the remainder of the year. Mr. Goss' work as District Surveyor, Taiping, was rather interrupted by his having to take charge of, at different times, the District Surveyor's work at Kuala Kangsar and at Lower Perak and the work of Assistant Superintendent, Office, Taiping.

Captain C. T. M. Husband was District Surveyor, Kuala Kangsar, from 1st January, 1924, to 26th May, 1924, Mr. J. D. Purcell from 26th May, 1924, to 25th August, 1924, Mr. P. H. Goss from 25th August, 1924, to 25th September, 1924, and Mr. J. H. Spowers from 25th September, 1924, to the end of the year.

There was no District Surveyor, Batang Padang, during the year, the work in this district was attended to by the Deputy Superintendent, Revenue Surveys, Kinta, in addition to his other duties.

Mr. C. Y. B. Sewell was District Surveyor, Lower Perak, from 1st January, 1924, to 1st July, 1924, Mr. P. H. Goss from 1st July, 1924, to 5th August, 1924, and Capt. R. V. Morris from 5th August, 1924, to the end of the year.

Mr. W. H. Stubington was employed in Upper Perak from 1st January, 1924, to 19th February, 1924, when he was transferred to Pahang.

The effective strength was 164.2 as compared with 180.8 in 1923 and 186.9 in 1922.

#### GENERAL REMARKS.

17. In the 1922 and 1923 reports attention was drawn to the large arrears in office work (i.e., the large number of lots for which the field work but not the office work had been completed).



The figures being 6,200 lots in 1922, 3,714 lots in 1923 and now at end of 1924 only 477 lots. This is very satisfactory and reflects credit on the office staff.

18. A suitable and up-to-date Survey Office building is very necessary.

19. The following is a list of the prepared extracts for native holdings returned to this office to date:

EXTRACTS RETURNED, *vide* COM. OF LANDS 24 IN 128/23.

	1923.	1924.	Total.
Larut and Matang ...	475	—	475
Krian ...	186	—	186
Selama ...	236	5	241
Kuala Kangsar ...	826	—	826
Upper Perak ...	—	—	—
Batang Padang ...	108	—	108
Lower Perak ...	769	369	1,138
	<u>2,600</u>	<u>374</u>	<u>2,974</u>

The number of requisitions completed (that is, field and office work completed) but returned by Collectors, the extracts not being required as the lots remain State land, was 40 requisitions for 217 lots.

20. In March a Conference of Perak District Surveyors was held in Taiping, at which a great deal of useful work was gone through.

These Conferences are of great use in producing uniformity and in giving all concerned the opportunity for exchange of ideas and opinions thus moulding the efforts of all to the same objectives. They also save a great amount of correspondence.

SELANGOR.

Mr. F. R. Twiss, Superintendent.

The expenditure on the Revenue Surveys was \$173,055 inclusive of Clerical Service and Temporary Allowance against \$206,176 in 1923.

The revenue collected was \$44,600 as compared with \$50,436 in 1923.

The value of work done for other departments for which no fees were charged was \$28,124.

OUTTURN AND COST.

FIELD.

The total number of portions surveyed for mining, agriculture and small holdings amounted to 1,294 of a total area of 13,497 acres being a decrease of 2,399 portions and 4,499 acres which is principally in the areas surveyed for mining and small holdings.

One hundred and forty-four town lots and residential sites were surveyed compared with seven hundred and eight in 1923.

There were also 357 miles of traverse surveyed for control and other purposes compared with 257 miles in the previous year.

The average cost of all surveys, exclusive of miscellaneous topographical, was reduced from \$1.00 to \$0.91 per chain.

The cost per acre of mining, agricultural and small holdings was \$3.33, \$0.96 and \$2.06, respectively, against \$2.20, \$1.28 and \$1.80 in 1923.

OFFICE.

The cost of the Drafting Branch was \$75,100 as against \$79,645 in 1923.

The total number of titles prepared for registration was 5,224 against 3,241 in 1923. The preparation of the balance of 39 one-chain Sheets of Kuala Lumpur, necessitated by the extension of the Town boundary, were completed.

During the year the State map and maps of all districts were revised to date and copies of the State map and of the districts of Ulu Selangor, Kuala Selangor, Kuala Lumpur, Kuala Langat and the sub-district of Sabak Bernam were reproduced by the Photo-Litho Branch.

An 8-chain map of Kuala Lumpur town has also been prepared for reproduction.

The issue of 8-chain litho sheets, showing all property boundaries within the State has also been completed.



### PROGRESS WITH REFERENCE TO REQUISITIONS.

The number of unsatisfied requisitions at the beginning of the year comprised 8,708 portions and during the year requisitions for the survey of 1912 portions were received, making a total of 10,620.

During the year 6,901 portions were satisfied and 37 cancelled compared with 2,894 satisfied and 21 cancelled in 1923.

Of the unsatisfied requisitions 716 portions awaiting survey, 1,617 were in hand in the Drafting Office and 1,349 were in the Land Offices for settlement. Comparative figures for 1923 were 1,508, 4,135 and 3,065, respectively.

### PARTICULARS OF WORK.

In addition to the usual revenue surveys a contour survey was made of the environs of Kuala Kubu and the Selangor Valley to Kuala Renning, and plans supplied to the Public Works Department in connection with a proposal to divert the main river.

The effective strength was 78.6 against 87.6 in 1923. The average sick leave was 4.3 per man against 5.3 in 1923.

### NEGRI SEMBILAN.

Mr. E. Aune, Acting Superintendent.

The demand for surveys was greater than in 1923. The number of lots for which survey was requisitioned rose from 589 in 1923 to 852 in 1924, the increase being almost entirely in small agricultural holdings in the districts of Kuala Pilah and Tampin; mining increased by nine lots only.

2. The assistance afforded by this branch during 1923 to the revisionary survey of Malacca Territory was continued during the first half of 1924. In July it was decided to discontinue this help; no fresh requisitions were taken in hand and our men were gradually withdrawn.

3. Four of our computers were lent to the Singapore department on urgent Government work for a period of three months, August to October.

4. Expenditure amounted to \$158,100 as compared with \$174,339 in 1923.

Of this expenditure \$17,205 represents the cost of work done in connection with the Malacca Revisionary Survey and \$2,055 represents the salaries and allowances of the four officers lent to Singapore.

The revenue for the year including the above amounts is \$38,772 as compared with \$24,635 in 1923, making the nett cost \$119,328 as against \$149,704 for 1923.

5. Irrecoverable fees in respect of work done for other Government departments stand at \$26,668, distributed as follows:

Forest	...	...	...	...	...	...	...	\$ 2,663
Government Town Planner	...	...	...	...	...	...	...	745
Lands	...	...	...	...	...	...	...	14,788
Public Works	...	...	...	...	...	...	...	8,472
								<hr/> \$26,668

The last item represents requisitions "to verify and, where missing, to replace road reserve boundary marks" on the public roads of the State.

6. *Field Work*.—Cost \$37,076—652 lots were surveyed against 773 in 1923. In November and, still more, during December there was rather a rush of requisitions amounting to 188 lots with the result that 283 lots were awaiting survey at the end of the year.

This number will be brought down during the next three months but it is rather well than otherwise if requisitions be allowed to accumulate to some extent as it cheapens the survey. When a Surveyor can attend to three or four surveys in a locality instead of a single one only, the cost immediately comes down.

In connection with the field work the following points deserve comment:

(a) The verification of marks defining the reserve for public roads brought to light several encroachments made by the road on private lands, and *vice versa*, and these have been referred to the departments concerned.

When attending to this work opportunity was taken of bringing our sheets up to date as regards location of new mileposts, drains, culverts, bridges and other road details.

Up to the present 175 miles have been dealt with leaving a balance of 285 miles still to do.



- (b) Other important special surveys are: Details and contours of the towns of Seremban, Kuala Pilah and Gemas and the villages of Kuala Klawang and Pertang.

Part of the Seremban area was undertaken to meet the Government Town Planner's requirements.

The detail town surveys were done with theodolite up till July when the advent of two experienced assistants, lent by the Topographical Survey Branch, enabled plane-tables to be used. These men will return to the Topographical Branch at the end of February but two of our own assistants, who were attached to their parties for purposes of training, are now working for progress and will, it is hoped, be able to carry on the work on the same lines.

The use of the plane-table for such surveys is, I think, in every way preferable and it would be well were more of our assistants made conversant with its use.

With a field staff so trained, a temporary lull in the demand for title surveys would cause no inconvenience as the men could be employed on various detail—and contour work, the demand for which would always be present.

7. *Office*.—Cost \$60,132—1,472 titles were prepared against 1,881 in 1923.

Of other items dealt with the following deserve to be mentioned:

- (a) The revision of the mukim registers is now practically completed and agreement thus established between titles and survey records. The amendment of some incorrect titles still remains to be done but they are being attended to as the Land Offices see their way of calling them in for correction.
- (b) The Seremban Town Limit Extension, recently gazetted, involves the amendment of the titles of a great many holdings and this work is progressing.
- (c) The Malacca Revisionary Survey. 1,366 lots with an acreage of 18,836 were computed.
- (d) Substituting 4-chain standard sheets in place of 8-chain sheets in congested areas. Thirty-seven sheets were prepared leaving 17 sheets still to be completed.
- (e) Tracing of standard sheets for litho reproductions. Fifty-three tracings were made and lithographic prints already exist for 39 of these.
- (f) Town Maps. A map of Seremban on an 8-chain scale is in course of preparation. A 4-chain map of Gemas is far advanced.

One-chain topographical sheets of Kuala Pilah and Kuala Klawang are being completed and from these it is proposed to prepare maps on a 4-chain scale.

8. *Personnel*.—Mr. W. H. Hanson was in charge up to 2nd July, when he proceeded on leave prior to retirement.

Mr. E. Aune was Acting Superintendent for the remainder of the year.

Mr. J. M. Favell was District Surveyor for Kuala Pilah, Jelebu and part of Tampin district and he also supervised the Malacca work until he left for Perak in the middle of June.

Mr. Nugent was District Surveyor in Seremban, Coast and part of Tampin districts and took over, in addition, Mr. Favell's work after the latter's departure. Since August, however, the Superintendent looked after the Kuala Pilah and Jelebu districts.

The Drafting Office was throughout the year in charge of Mr. S. Thambyrajah.

#### PAHANG.

Mr. J. Griffiths, Acting Superintendent.

#### EXPENDITURE AND REVENUE.

The expenditure amounted to \$193,255. The corresponding figures for the previous year were \$209,741.

The revenue collected was \$25,939 as compared with \$10,484 in 1923. Free surveys for other departments cost \$31,207 as compared with \$28,377 in 1923.

#### OUTTURN AND COST.

The field expenditure amounted to \$61,744 as compared with \$66,332 in 1923. In all 1,157 lots, 199,272 acres and 98,858 chains were surveyed as compared with 2,007 lots, 52,415 acres and 97,908 chains in 1923. The cost per chain was \$0.62 as compared with \$0.68 in 1923.



## OFFICE.

The cost of the Drafting Staff including supervision and temporary allowances amounted to \$73,960 as compared with \$76,134 in 1923.

Documents of titles totalled 4,327 as against 3,107 in 1923.

The office is now in possession of a complete series of 8-chain standard sheets, 94 sheets having been completed during the year.

Progress has been made with the 32-chain standard sheets of which 28 were completed and 14 were in hand, leaving 27 sheets still to be prepared.

Sixty-seven 8-chain sheets were lithographed during the year and the results sent to the District Officers and District Surveyors concerned.

## PROGRESS WITH REFERENCE TO REQUISITIONS.

The number of unsatisfied requisitions at the close of the year was 2,884 against 4,607 in 1923. The total number of requisitions awaiting survey was 660 against 577 in 1923.

## PARTICULARS OF WORK.

Eighty-three miles of detail survey of roads for the Public Works Department were completed.

Gaps in the railway reserve from Bukit Kota to Krambit were surveyed.

The survey of the forest reserves at Kechau, Binchah and Bilut were completed, those in hand include Jenka, Lakum and Kemasul.

Seven lots were surveyed on Bukit Fraser and a control traverse made with the object of charting accurately such leases as are still in existence in this locality.

A mining lease for 6,855 acres in the Sempan Valley was completed and lease issued.

The survey of the holdings within Pekan Lama, known as the Sultanate Lands, was completed and the office work in connection therewith well in hand.

The Sungei Panching and its tributaries were surveyed. The survey of two blocks of mining land on the Sungei Kinchin in the Rompin district was completed. This land is very inaccessible and the connections necessitated the fixation of a trigonometrical point on Bukit Peradong and a traverse of  $7\frac{1}{2}$  miles from Gunting Kriong on the Pahang Johore boundary.

## EFFECTIVE STRENGTH.

Mr. H. J. Mackenzie, Superintendent, was in charge until his departure on long leave on 30th July. Mr. H. A. Dijkerman, Assistant Superintendent, acted until the 14th September, when he was relieved by Mr. J. Griffiths, who remained in charge until the end of the year.

Mr. J. D. Purcell, Assistant Superintendent, Office, was in charge of the Drafting Office until the 31st January, when he was transferred to the Trigonometrical Branch. He was relieved by Mr. H. A. Dijkerman, who remained in charge until the 22nd August on which date Mr. L. D. Meyer was appointed to his place.

Mr. R. A. Stubington, Assistant Superintendent, who was in charge of the Temerloh district, proceeded on leave on the 25th February. Mr. W. H. Stubington relieved him and remained in charge until the end of the year.

Mr. F. F. Byatt, Surveyor on Agreement, who was in charge of the Kuala Lipis, Raub and Bentong districts, was transferred to Perak in June 16th and was relieved by Mr. H. A. Dijkerman.

The effective strength for the year was, field staff 23.11, drafting staff 58.99 or a total of 82.1 compared with a total of 92.03 in 1923. The field staff was increased by 1.02 but the decrease in the office staff amounted to 10.95.

Sickness averaged 6.2 days per effective as against 4.4 days in 1923.

## GENERAL.

The district of Bentong was placed under the District Surveyor, Temerloh, from the beginning of August.

## BOUNDARY MARKS.

Ten thousand three hundred and fifty-nine reinforced concrete boundary marks were manufactured in the State during the year at a cost of \$2,956=22.3 cents per mark in 1923.

During the year 6,684 boundary marks were used in survey. The cost of handling same was 29.0 cents per mark, bringing the cost of a planted mark up to 49.3 cents per unit.

The boundary mark factory at Kuantan was closed down on October 31st. It is estimated that the supply of marks on hand is sufficient to provide for the requirements of this district for the next two years.



# RETURN SHOWING STATE OF SURVEY WORK WITH REFERENCE TO REQUISITIONS.

Details.	Agricultural Lots.			Mining Lots.			Native Holdings.			Town Lots.		Resid. Areas.		Reserves other than Forest.		Sub-divisions.		Miscellaneous.	
	Req.	Lots.	Acres.	Req.	Lots.	Acres	Req.	Lots.	Acres.	Req.	Lots.	Req.	Acres.	Req.	Acres.	Req.	Lots.	Req.	Items.
Details: Unsatisfied requisitions awaiting surveys ... ..	...	152	2,539	...	127	11,523	...	1,910	6,256	...	91	759	254	160	5,287	...	453	...	12
In Land Office for settlement ... ..	...	33	3,365	...	...	...	...	6,901	24,245	...	29	...	...	37	1,121	...	429	...	9
Awaiting action in office ... ..	...	78	16,421	...	83	4,417	...	9,281	26,294	...	410	...	...	182	5,779	...	458	...	15
Total unsatisfied requisitions on 31st December ... ..	...	253	22,325	...	210	15,940	...	18,092	56,795	...	530	759	254	379	12,187	...	1,340	...	36
Requisitions received in 1924 ... ..	...	203	9,238	...	404	8,850	...	4,930	18,264	...	262	21	33	264	139,819	...	986	...	201
Total of above ... ..	...	466	31,563	...	614	24,795	...	23,022	75,059	...	792	780	287	643	152,006	...	2,326	...	237
Requisitions satisfied during 1924 ... ..	...	220	16,018	...	437	20,855	...	14,183	47,310	...	441	19	18	399	5,531	...	1,321	...	194
„ cancelled during 1924 ... ..	...	2	55	...	24	172	...	182	660	...	1	...	...	16	57	...	43	...	4
„ remaining unsatisfied on 31st December, 1924 ... ..	...	244	15,940	...	153	3,768	...	8,657	27,089	...	350	761	269	228	146,418	...	962	...	39
Total agreeing with total above ... ..	...	466	31,563	...	614	24,795	...	23,022	75,059	...	792	780	287	643	152,006	...	2,326	...	237
Details: Unsatisfied requisitions. Awaiting survey or demarcation... ..	...	88	3,110	...	98	1,731	...	1,929	5,706	...	134	2	13	111	141,547	...	255	...	22
In Land Office for settlement ... ..	...	28	3,580	...	...	...	...	4,580	15,158	...	185	...	...	23	2,729	...	325	...	4
Awaiting action in office ... ..	...	128	8,800	...	55	2,037	...	2,148	6,225	...	31	759	256	94	2,142	...	382	...	13
Total unsatisfied requisitions ... ..	...	244	15,490	...	153	3,768	...	8,657	27,089	...	350	761	269	228	146,418	...	962	...	39

NOTE.—A requisition is “satisfied” when the work of the Survey Department is so far completed that titles can be supplied when demanded.  
Number of documents for title issued.



## GENERAL.

The Surveyor-General was on leave from 19th January to 25th October. Three months of this period were spent at Wembley Exhibition assisting Mr. A. Caldecott in organising the exhibits at the Malaya Pavilion.

Capt. C. J. Perkins acted as Surveyor-General and Mr. J. Dewar as Assistant Surveyor-General and the writer desires to record his very great appreciation of the work of these officers in carrying on the reorganisation of the department.

On the return of the Surveyor-General, Mr. Dewar was appointed a Commissioner to report on the subordinate staff and in particular on the work of the Revenue Survey Offices. His report will be presented and will be dealt with during 1925.

Frequent inspections were made of the various States and settlements in the Federated Malay States and Straits Settlements by the Acting Surveyor-General and the Acting Assistant Surveyor-General.

Capt. Perkins paid a visit to Cameron's Highlands, a proposed hill station, accompanied by Colonel Forster, C.R.E., and Colonel Faulkner, P.M.O., Malaya Command.

Mr. J. D. Purcell was seconded for special surveys in Kelantan in connection with the case of the Duff Development Company *versus* the Government of Kelantan and in September was sent to England to give evidence in the arbitration.

## PROMOTIONS.

Mr. W. A. Gummer was promoted to the rank of Superintendent of Surveys from 15th August.

## CHANGES OF STAFF.

Messrs. G. F. Ward, J. Read, F. L. Harding, A. G. Billing and S. E. Sharpe, Licensed Surveyors, joined the staff of the department during the year and Mr. G. G. T. Browne, A.C.A., joined the head-quarters staff as Accountant.

Eight subordinate officers were recruited and the subordinate staff was reduced by twenty-two of whom twelve retired, five resigned, two were dismissed and three died.

Work was commenced on the addition to the survey buildings in Kuala Lumpur.

The year under review may be classed as one of steady progress. The department is now able to cope with all current revenue work without delay and the records are gradually being brought up to date and made available in the shape of the standard 8-chain sheets.

A marked feature is the greatly increased demand for topographical surveys on all scales. The most notable single map so far issued by the department was published during this year. It is the 4 inches to a mile map of Singapore and the adjacent islands. As a piece of mapping and in style of production it challenges comparison with any similar map produced elsewhere. This is mentioned as an illustration of what can be done by local youths, Malays, Chinese and Tamils, when they are efficiently trained and supervised by European officers.

The instrument making and repairing branch is also a forcible illustration of this fact. The youths employed in this branch are taught a very useful trade and the work of this branch is, as stated in last year's report, not only of the greatest service to the department but it saves a great deal of money by prolonging the life of the instruments used in surveying. The manufacture of many of the instruments required has a further advantage that it circulates the money in the country instead of sending it abroad.

In conclusion the Surveyor-General desires to express his appreciation of the efforts of all administrative officers, especially those of the revenue branch, to reduce expenditure while maintaining efficiency.

KUALA LUMPUR,  
March, 1925.

V. A. LÖWINGER,  
Surveyor-General, F.M.S. & S.S.