

Federation of Malaya – Colonial Geological Surveys 1947-1956

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From Dixey, F. 1957. [Colonial Geological Surveys 1947-1956: a review of progress during the past ten years](#). Colonial geology and mineral resources. Bulletin supplement No. 2. London: HMSO.

Federation of Malaya^[1]

1. [↑] While this Report was in the press, the Federation of Malaya attained independence within the British Commonwealth on 31st August, 1957.

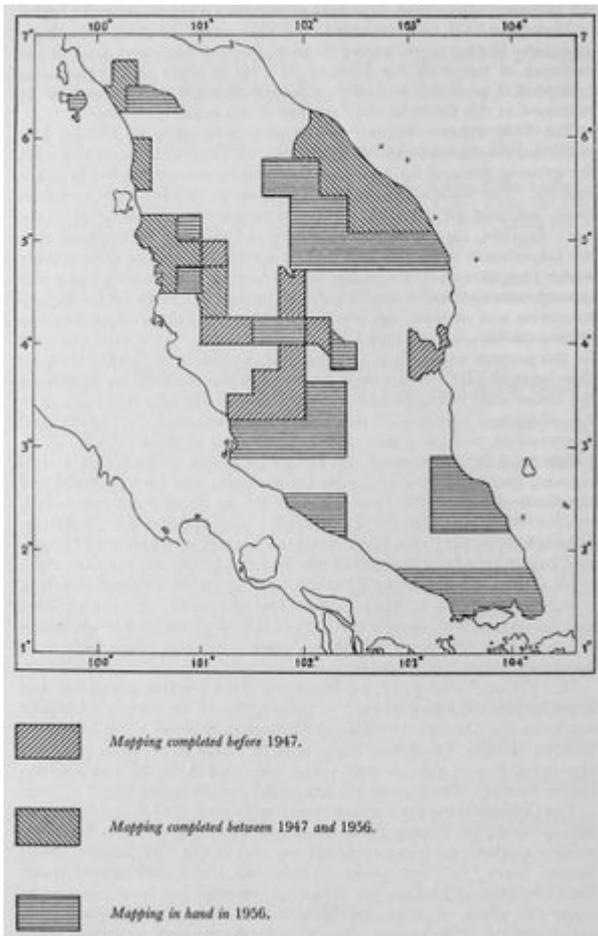


Activities of the Geological Survey, Federation of Malaya. Aborigines watch with interest as the Director of the Geological Survey Department (Mr. Harold Service) and his field assistants pan the river silt for alluvial deposits. By courtesy C.O.I., London. Plate XIV.



Activities of the Geological Survey, Federation of Malaya. Camps like this are generally used by the Geological Survey for only one or two nights. The difficulties of geological mapping in jungle-covered areas can be imagined. By courtesy C.O.I.,

London. Plate XIV.



Mapping by Geological Survey Department of Federation of Malaya. Text-fig. 12.

Although some geological investigations had been carried out earlier by the curator of the Perak Museum, geological survey work really began in Malaya in 1903, and continued until 1912 under the charge of a single geologist. During the following 30 years the staff increased, until at the outbreak of war with the Japanese in 1941 it stood at 9, comprising 1 director, 6 geologists, including a mining geologist, and 2 chemists. It remained at this figure until 1950 when it was again increased.

The 1939 Fermor Report on the mining industry of Malaya had contained recommendations for enlarging the Geological Survey to meet the growing demand for more rapid and more intensive coverage of the country. The recommendations were, however, shelved when hostilities broke out, and all geological work was stopped for the duration of the war. In 1944, the Committee on Colonial Geology recommended that the Department should be enlarged on a regional basis so as to include within its sphere of operation the British territories in Borneo, but it was subsequently decided to form a separate geological survey for the Borneo territories and so attention was again directed towards expanding the Geological Survey within the Federation of Malaya. A grant of £325,000 for this purpose was made in 1950 from funds provided under the Colonial Development and Welfare Acts, approval being obtained for increasing the senior staff establishment to 23, as against the pre-War total of 9. An additional increase of one was later authorised by the Federal Government, and the senior staff establishment in June 1956 stood at: 1 director, 1 deputy director, 2 principal geologists, 15 geologists, 1 chief chemist, and 4 chemists, two posts being vacant, one for a geologist and one for a chemist. The junior staff at this time, all locally recruited, totalled 84, as against 28 in 1947, and were predominantly Malay, although in recent years there has been a marked increase of Chinese and Indian recruits, especially in the field and laboratory divisions. The grant was later increased to £356,156, and, in addition to staff increases, it included provision for

the purchase of certain major items of laboratory and field equipment, and for the construction of a large new headquarters offices-laboratories-museum building, some outstation offices, and some houses for senior and junior staff.

In 1954, the Mission of the Industrial Bank for Reconstruction and Development endorsed certain proposals, based on recommendations made by the Director of Colonial Geological Surveys when he visited Malaya in 1953, for certain minor staff increases required to place the Geological Survey permanently on an improved technical and administrative footing. These proposals are under consideration.

The Geological Survey operated specifically until 1947 in the Federated Malay States, but arrangements made with local Governments from time to time enabled work to be carried out also in the Unfederated Malay States. Since 1947, first under the Malayan Union and latterly under the Federation of Malaya, the sphere of operation has been extended to cover the whole of peninsular Malaya and the adjoining islands with the exception of Singapore. Twelve-miles-to-one-inch geological maps of Malaya have been printed from time to time, the latest edition of these being in 1948, although it still contained several "blank" areas that have never been adequately examined, even on a reconnaissance basis.

In recent years work has, therefore, been directed towards the systematic mapping of as much of the country as possible on a scale of one mile to one inch and, despite complications arising from the Emergency that has affected Malaya since 1948, good progress has been made since 1947. During the resettlement "drive" in 1951, the Deputy Director and four geologists were released for full-time Emergency duties, several other members of the senior and junior staff helping on a part-time basis. Some areas that would otherwise have been given priority for detailed geological mapping have been impossible to work in, and in most areas where field work has been carried out it has been necessary to obtain Security Forces clearance before arranging field trips; indeed, in many cases it has been necessary to work under armed escort. First attention has naturally been paid to areas that show possibilities of containing workable mineral deposits, or on which, for other reasons—engineering, land usage, etc.—geological information has been urgently required.

Progress in systematic one-inch-to-one-mile geological mapping during the period under review has been as follows:

	Square miles	Percentage of total
Completed before 1947	4,230	8.3
Completed since 1947	6,270	12.3
In hand at end of 1956	15,460	30.3
Yet to be mapped	25,035	49.1
Total	50,995	100.0

Geological mapping is based on excellent one-mile-to-one-inch topographical map sheets published by the Surveyor-General, Malaya. Even in 1947 these map sheets covered approximately one half of the country, and they have since been extended by the use of aerial photography to cover the whole of it—either in completed form showing full topographical detail, or as air reconnaissance maps showing form lines instead of accurate contours. The Geological Survey maintains in its library a complete set of the aerial photographs taken in connection with the post-War surveys, and full use is made of the photogeological information revealed by them; in this connection, much valuable help is received from the Photogeological Section of the Directorate of Colonial Geological Surveys.

The systematic geological mapping that has been carried out during the 10-year period, and

especially in the past five years since the number of field geologists has been increased, has greatly augmented the available knowledge of Malayan stratigraphy. It was first shown that the areas of Triassic sediments are much smaller in extent than they were previously thought to be, and proof has recently been obtained of the hitherto unknown existence of Ordovician and Cambrian rocks in the northwestern part of Malaya and the adjoining islands. These older Palaeozoic rocks were identified by geologists from the Malayan and Thai Geological Surveys in the course of a combined field survey organised in order to correlate the geological formations that occur on both sides of the border between the two countries.

It is satisfactory to record that other Government Departments, mining and commercial firms, and the general public are nowadays becoming increasingly conscious of the consultative services that the Geological Survey is equipped to provide. Many hundreds of specimens of rocks and minerals are identified annually; there is a constant demand for information from the central collection of prospecting records maintained at Geological Survey headquarters; advice is given on the distribution of rock types that yield good agricultural soils, etc.; and miners are increasingly seeking geological information that may enable them to win more ore from their existing mines, or lead them to discover new mining areas. It is becoming a matter of routine for the Department to be consulted in connection with engineering projects that involve foundation problems. Indeed, the Geological Survey has taken leading parts in the site investigational work carried out for the Klang Gates water-supply dam, the Cameron Highlands hydro-electric scheme, and the Connaught Bridge power station, and has furnished reports on several other lesser-known projects that have been investigated within the last ten years. Within the past five years, attention has become increasingly focused upon the need to ensure that the natural resources of the country are developed in the best possible way. To this end, most States and Settlements have new Natural Resources Boards on which the Geological Survey is represented.

The Geological Survey of Malaya maintains close liaison with the Department of Mines in all matters connected with the search for, and the development of, mineral deposits and, in the period under review, noteworthy progress has been made in co-ordinating the efforts of the two Departments in the mineral resources field. Whereas both Departments had previously maintained their own drilling organisations, these have now been amalgamated into a combined Mineral Investigation Drilling Unit, and plans are being put into effect for co-ordinating the laboratory services of the two Departments, and for establishing a combined office that will, it is expected, later develop into a mineral resources bureau. With the dual aim of searching for new mineral deposits, and accelerating geological mapping, plans are now well advanced to carry out, as aid under the Colombo Plan, combined aeromagnetic and radiometric surveys by air over approximately one-third of Malaya, including most of the non-mountainous parts of the country, and it is hoped that important information will be obtained. In 1954, the Department was fortunate enough to secure the services of the Assistant Director of Research, University Sub-Department of Quaternary Research, Cambridge, to undertake a preliminary study of the tin-bearing alluvium of the Kinta Valley using modern Quaternary geological techniques. The work, though necessarily short, showed that Quaternary research techniques can profitably be applied in elucidating the geological history of the Kinta Valley and, thus, in searching for new tin deposits both there and elsewhere in Malaya.

The Geological Survey has long been called upon for information in connection with underground water-supply problems, and the demand for advice has increased markedly during the period under review.

Having no water-supply division of its own, the Department obtained the services late in 1955 of a United Nations hydrologist to carry out reconnaissance surveys of some of the areas where underground water supplies are most urgently needed. His report was favourable, and it is hoped soon to obtain United Nations assistance in actually proving and developing underground water-

supplies in selected places. The need has not been overlooked to investigate the practical applicability of geophysical methods to geological problems in Malaya. Accordingly, in 1954, the United Nations Technical Assistance Administration provided a team of geophysicists to carry out electrical, magnetic, and seismic geophysical tests under a wide variety of conditions in Malaya. Part of the cost of this investigation was met from the Colonial Development and Welfare Fund grant for the expansion of the Geological Survey, and it was thereby possible for the investigation to be extended to six months from its original period of three months. The team's report showed that there is scope for the use of geophysical methods, but it has not yet been decided to what extent problems calling for geophysical work should be handled departmentally by the Geological Survey, or by geophysicists called in from abroad.

With funds provided in the grant made in 1950 from the Colonial Development and Welfare Fund, new chemical and mineralogical laboratories have recently been completed as part of the new headquarters of the Geological Survey. Spacious, and designed specially for Malayan needs, the new laboratories contain modern equipment (spectrophotometer, X-ray diffraction equipment, and the like), and have already proved to be a great boon to the Department. The chemical and mineralogical laboratories are run in close co-operation with the Research Division of the Department of Mines which has recently moved into a neighbouring new building. The Department of Mines laboratory concerns itself chiefly with investigations into improving ore-beneficiation methods, but most of the chemical and mineralogical analyses required in this work is done in the Geological Survey laboratories. Large numbers of chemical and mineralogical analyses are carried out for mining companies and also for Government Departments, and samples are received from the Geological Survey of the British Territories in Borneo. Because of the great demand for chemical work from outside sources and the difficulty of recruiting the full establishment of chemists, many rock analyses and other chemical work required in recent years by the geologists have been delayed.

The principal post-War publications of the Geological Survey have been:

The Geology and Mineral Resources of the Neighbourhood of Chegar Perah and Merapoh, Pahang, by J. A. Richardson. [Memoir No. 4 (New Series), 1950.]

The Geology and Mineral Resources of the Fraser's Hill area, Selangor, Perak, and Pahang, by F. W. Roe. [Memoir No. 5 (New Series), 1951.] " The Geology and Mineral Resources of the Neighbourhood of Kuantan, Pahang, by F. H. Fitch. [Memoir No. 6 (New Series), 1952.]

The Geology and Mineral Resources of the Neighbourhood of Kuala Selangor and Rasa, Selangor, Federation of Malaya, with an account of the Geology of Batu Arang Coal-Field, by F. W. Roe. [Memoir No. 7 (New Series), 1953.]

These publications are accompanied by coloured geological maps on a scale of one-mile-to-one-inch, and contain detailed geological descriptions of the areas illustrated in the maps. A memoir on the geology of the Kinta Valley is now being edited for publication, and memoirs on areas in Trengganu and Kedah are being drafted.

A new edition of the twelve-miles-to-one-inch coloured geological map of Malaya was published in 1948, and work has now begun on revising it for publication in 1957. A black-and-white map of Malaya, overprinted to show the location of the main mineral deposits, was also published in 1948 on a scale of twelve-miles-to-one-inch. One-inch-to-one-mile geological maps of four map sheets (two in Pahang and two in Perak) have recently been completed and are awaiting publication, and work is in hand on drafting several others. Skeleton black-and-white maps overprinted to show " mining areas ", "potential mining areas", "possible mining areas", and "areas not required for mining" have also been published since the War for all except three States and Settlements; these are proving of

especial value to local Governments in settling land-usage problems.

Departmental Annual Reports on the Geological Survey have not been published since 1949, initially because of a general Government instruction to dispense with them in order to allow more time for Emergency work, and latterly because of pressure of other work. It is intended soon to publish a report on the period from 1950, and thereafter to reintroduce the publication of Annual Reports. In the past it was the practice to include in such reports lengthy, and often detailed, descriptions of the geology of areas covered by the geologists in the course of their field work, but in future it is intended that Annual Reports should be mainly administrative and should include only brief summaries of the results of field work, leaving detailed descriptions for publication in Records or, if suitable, in Memoirs of the Geological Survey.

From time to time papers are presented by the staff to geological and allied congresses and conferences, as for instance:

Notes on the Iron-ore Deposits of the Federation of Malaya, by F. T. Ingham. [19th Session International Geological Congress; Algiers, 1952.]

County Report (Federation of Malaya), by H. Service and I. L. Patterson. [E.C.A.F.E. Regional Conference on Mineral Resources Development; Tokyo, 1953.]

Mineral occurrences

Tin and tin ores

Water supply

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