

lieve that they can learn from others. Especially are they unwilling to believe that they can learn from others who are not executives, who have not "met a payroll" or "negotiated a labor contract."

The fact of the matter is that executive development programs are today a permanent institution. They thrive not because professors can teach businessmen how to run their companies, but because professors offer a climate in which new ideas can be developed by businessmen themselves. By getting out and into these creative climates, businessmen can become challenged to see things differently than when they are deeply involved in their routine problems

and practices.

In the face of the huge acceptance of executive development programs, the executive should not be ashamed or humiliated by being sent or by asking to be sent. At such times, companies should be well aware of what programs will be most useful to him. This means that both the executive and his company must appreciate that change potentials exist even in those who are senior citizens.

One thing is certain; the executive will change. What he needs is help to translate his change potential into creative performance. In this way the success of both the executive and his company will be better assured.

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SPECIAL ARTICLE

THE SURVEY OF THE SEYCHELLES ARCHIPELAGO

'One of our members, Mr. A.C. McEwen, O.L.S., D.L.S., F.R.G.S., was engaged for three years on the survey of a part of the world little known to most of us, the Seychelles Archipelago.

This work was recently carried out under the direction of the Bureau of Technical Assistance Operations of the United Nations. Mr. McEwen at a recent annual meeting gave a brief account of the survey. Since then he has been good enough to place at our disposal a copy of his report entitled "Land Survey and Land Registration in Seychelles". His report is divided into an Introduction and five Parts.

The Introduction gives an outline of the problem, Part I deals with the present position in relation to land surveys and registration, Part II with Topographical Mapping, Part III with Control Survey, and Part IV is a draft of proposed regulations and laws dealing with surveys and surveyors. The whole report comprises about 100 pages. The following is an attempt to condense this report for publication.'

W. J. Baird, Secretary

Introduction

The Seychelles Archipelago lies in the Indian Ocean between 4 and 10 degrees South Latitude and between 46 and 56 degrees East Longitude. It contains a nucleus of granitic islands, surrounded by a number of islands of coral formation. The total number of islands, islets and named rocks is about 116.

Mahe is the largest and most important island, with an area of 55-1/2 square miles, and lies about 990 miles east of Mombasa. The capital and only town is Victoria. The climate is quite temperate, seldom exceeding 85 degrees F. The rainfall is about 100 inches a year. The total population is 41,468, most of whom are descendants of the original French settlers and of their slaves. English is the official language. French is also spoken and taught. A patois called Creole is widely spoken.

The main export crop is cocoanut. Other crops are cinnamon, vanillia and patchouli. The land is divided into holdings, known locally as estates. These total about 2200, of which about 1000 contain less than one acre, and a few over 1000 acres. A holding represents an ownership, rather than a geographic division. The Land Law is based on the Old French Civil Code, modified by local ordinances.

The Survey Problem

The survey problem was two-fold - to provide a basis for a cadastral sur-

vey and secondly to provide for a topographical map. It was decided that the topographic mapping should be undertaken by photogrammetric methods.

The first surveys and maps were made shortly after the arrival of the first settlers from Mauritius in 1770. Later maps were prepared from time to time, but most of these were really of a graphic or pictorial nature and lacking in measurements and bearings.

Confusion was compounded by the indiscriminate use of arpents and acres, sometimes taken as synonymous, and the general lack of any authorized unit of measurement. In 1958 the Executive Council adopted a recommendation that the metric system be used for surveys. Boundaries between holdings have seldom been defined by survey, and lack of fences, hedges, etc. makes it difficult to determine occupational limits.

Descriptions, as recorded, too often describe the east limits of Smith's land as the west limit of Brown's land, and vice versa, and there has been no regulation that a survey should be made in the case of division of property.

There has been a definite shortage of surveyors. In 1958 there were only two sworn land surveyors, both of whom were Government employees. So, few land surveys were made. This situation is being corrected by the training of young apprentices, some of this training being conducted by the U.N. team of Surveyors.

Topographic Mapping

It was decided that the Topographic Mapping should be based on aerial surveys. The photography was contracted to the Spartan Air Services Ltd. of Ottawa. The Directorate of Overseas Surveys was to undertake to map Mahe and the other principal islands at a scale of 1:10,000.

The Spartan Air Services sent a single-engined Norseman float-equipped aircraft carrying a 9" x 9" with a 6" Wild Aviogon lens. A pilot and a camera-operator/navigator constituted the normal crew.

The work was delayed by bad weather. Later the Norseman was replaced by a twin-engined Grumman Mallard float plane which had better climbing power and wider range than the Norseman.

Each roll of film was processed in Seychelles and sent to Ottawa for printing. Good use has already been made of the prints returned to Seychelles. From the prints supplemented by basic ground survey data, it is now possible to produce simple maps locally by radial line plotting.

In order to complete the 1:10,000 series, some additional control points will have to be established and the position of roads, streams, etc. obscured by foliage be determined by ground survey.

Control

At the beginning of 1958 the only basic survey control consisted of a small triangulation system covering the north east portion of Mahe, and some of the islands in Victoria Harbour. This had been undertaken in 1943 by the survey ship, H.M.S. Challenger.

In January, 1958, a party of Royal Engineers established a six-station Tellurometer traverse around Mahe. The mathematical results of the traverse and a triangulation were computed by the Directorate of Overseas Surveys. The results indicated that the Tellurometer traverse closed to 0.6" in azimuth and 1:53,000 in length.

Grid co-ordinate values in metres based on the Transverse Mercator projection and the Clarke 1880 spheroid, were supplied for each of the stations. The latitude of origin is taken as the Equator, with a false co-ordinate value of 10,000,000 metres North and the central meridian is placed at longitude 57 degrees East with a false co-ordinate value of 500,000 metres East and a negative scale

factor of 0.9996. The azimuth of the line from South East Island to Mount Howard was observed by both the Royal Engineers and H.M.S. Owen, and the mean value is $319^{\circ} 28' 51''.2$. Height datum is a brass plaque set by H.M.S. Challenger in 1943 which is 3.44 feet above mean sea level.

The results indicated that the Tellurometer traverse legs were sufficiently precise to be used as base lines for the establishment of a triangulation network in Mahe.

The activities of the United Nations Survey Team for the remaining two years were directed toward the establishment of control points both for the purpose of photogrammetric mapping and to act as a basic framework for future cadastral operations.

A reconnaissance of Mahe was made and sites for permanent triangulation stations were selected. These were marked by either a circular brass plaque with a 4" shank cemented into a drilled hole, or a 4" x 4" x 24" concrete block set in a masonry bed. All the more important stations have a permanent steel tripod beacon about 12 feet high with a sighting vane. 50 stations were occupied on Mahe and an additional 11 on neighbouring islands.

Linear measurements were made by a 100 metre x 1/16" steel band suspended in catenary, measurements were recorded to the nearest millimetre. Check measurements were made by a steel tape graduated in feet.

Angles were read with a T2 theodolite, one complete round on each face for both exterior and interior angles at each station. Horizontal misclosures to a maximum of 5" were accepted.

All field results have been recorded in locally printed field books, and are set out in a tabular form which facilitates checking and reduction of observations. For grid computational purposes the reduced linear measurements were corrected for scale factor. Computations have been recorded on traverse sheets and temporary co-ordinate values, which can be easily corrected when the main triangulation adjustment is complete, are computed to the nearest centimetre for each station. Much of the later traversing was undertaken by local trainee surveyors who have shown themselves capable of producing accurate work with minimum supervision.

Draft Survey Legislation, Land Survey Ordinance and Settlement of Boundaries Ordinance

The latter part of the report consists of these suggested or drafted Regulations and Laws, which are designed to bring order and system out of the present rather chaotic and unregulated practices with regard to the training and qualification of surveyors, the regulation of surveys and the settlement of boundaries.

Since these drafts have not yet been approved and legalized, it might be better to postpone their review until that has been done. It is noted that in a proposed tariff of fees for surveyors in practice, the suggested day rate is 60 rupees (about \$12).

A POSTSCRIPT BY THE SECRETARY

Shortly after writing the above I noticed in the issue of the Toronto Globe and Mail of 11 March, 1961, a photo of the charming Mrs. McEwen and the McEwen's two lovely daughters. This photo appeared at the head of an account of domestic life in Seychelles as related by Mrs. McEwen.

Mrs. McEwen is shown holding a new flag badge for Seychelles Islands that she was commissioned by the Government to design. The design has received the approval of H.M. Queen Elizabeth, and the Admiralty has agreed to its use in the fly of the blue ensign.

Perhaps Mrs. McEwen could be persuaded to try her hand at designing a new Canadian flag.

W.J. Baird.