

SUMMARY

In the reproduction of charts and maps, scribing is relatively new and its potentials are not fully explored. However, much progress has been made within a few years in the craft of scribing. Because additional instruments and materials are expected to be available, further progress may be made in the future. One factor, above all, has been very satisfying: anyone associated with scribing has found the effort very rewarding and the quality of the

product better than anticipated.

An Inter-Agency Committee on Negative Scribing was organized in March, 1954 for an advantageous exchange of information. This committee, made up of representatives of several Government mapping agencies, has contributed considerably to the remarkable success in scribing. A similar group of representatives is in the process of preparing an extensive Scribing Report at the direction of the Bureau of the Budget. It is expected that this publication will be available soon.

New Maps of Liberia

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THE Republic of Liberia lies on the southwest corner of the great bulge of the African continent. Its area of about 38,000 square miles is bounded by Sierra Leone on the west, French Guinea on the north, Ivory Coast on the east, and about 375 miles of the Atlantic Ocean on the south. Liberia lies entirely within the torrid zone; its most southern extremity, Cape Palmas, is less than 325 miles from the equator.

A joint agreement for technical cooperation relative to mapping was signed by the Government of Liberia and the United States in December 1950.

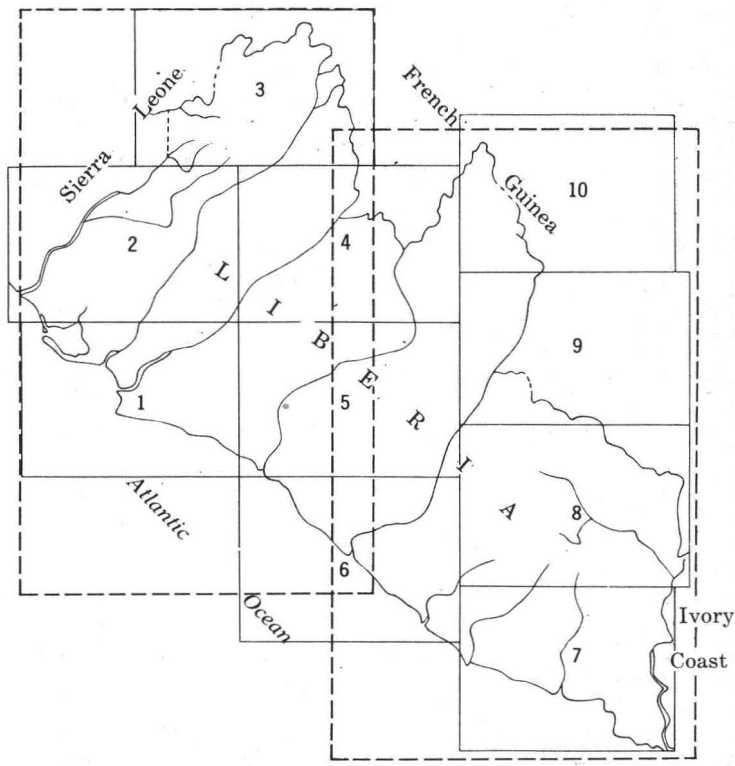
As one of its programs under this agreement, the U.S. International Cooperation Administration was to provide advisory and technical assistance in establishing the Liberian Cartographic Service. ICA obtained the services of the Coast and Geodetic Survey, U. S. Department of Commerce, as a cooperating agency directly responsible for this phase of its mapping program. The Aero Service Corporation, Philadelphia, Pennsylvania, was engaged to furnish (1) two sets of aerial photographs of the country at 1:400,000 scale, (2) two sets of photo indexes of the photography and, (3) two sets of controlled photo mosaics at 1:20,000 scale.

For ground-control, 20 second-order astronomic positions using the zenith camera, were established for the Liberian

Cartographic Service by Lt. John O. Boyer, C&GS, and one aide. At four of these sites the Aero Service Corporation set up shoran stations for control of the aerial photographs taken during the period from December 1952 to March 1953. Adjustment of the shoran-net for control of the aerial photography was made by the Geodesy Division, Coast and Geodetic Survey. The geographic datum was determined by an averaging process involving the shoran-net and the four astronomic stations connected to it.

The mapping and training program for the Liberian Cartographic Service was designed to prepare its employees for compiling planimetric maps at 1:20,000 scale from the shoran-controlled mosaics of the same scale. The geographic coordinates of Hotine's Skew Orthomorphic projection plane coordinates were ruled for these controlled mosaics from tables prepared by the Geodesy Division and published by the Coast and Geodetic Survey.

It became apparent toward the end of 1953 that it might be some time before the 522 projected planimetric maps at 1:20,000 scale would be completed. To provide the Liberian Government with complete map coverage in less time from the materials then available at little additional cost, the Coast and Geodetic Survey proposed to compile and publish (1) ten maps at 1:125,000 scale, (2) two maps at 1:500,000



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- 1:125,000 scale
 □ 1:500,000 scale

scale and, (3) one map at 1:1,000,000 scale (see illustration). This proposal was accepted by both governments.

The controlled photo mosaics at 1:20,000 scale for the Liberian Cartographic Service were made from controlled mosaics prepared at 1:40,000 scale. From the latter, the Coast and Geodetic Survey engaged the Aero Service Corporation to provide photographic reductions at 1:125,000 scale. The Coast and Geodetic Survey mission in Liberia compiled the ten maps of this series. These compilations were made by photo interpretation after stereoscopic examination of the 1:40,000 scale photographs. These maps were not field checked except for occasional field data obtained from other projects or during trips to the interior. The compilations were then sent to the Photogrammetry Division of the Coast and Geodetic Survey for scribing and publication.

Identification and delineation of the shoreline along the coast, or of rivers of double-line width, or of single line streams where the water surface was readily distinguishable, was no problem. Due to the heavy vegetative cover of the tropical rain forest the secondary tributaries were delineated only after careful stereoscopic examination of relief and the different density and texture of vegetation bordering streams, with the assistance of an occasional glimpse of a patch of open water surface.

The country's six major rivers run nearly normal to the coast and indicate a rather uniform gradient of the terrain from the interior to the ocean. Except for the St. John River Falls (about 40 to 50 feet high), this uniform slope is characterized by many rapids distributed throughout the lengths of the rivers until the coastal plain is reached.

Swamp and marsh areas with a heavy growth of mangrove are of sufficient size for delineation at 1:125,000 scale in the coastal areas only.

The thirty miles of paved roads in Liberia are all in and about the capital, Monrovia. All other roads in the country are unsurfaced and can be classified as all-weather and dry-weather roads. The dry-weather roads have no maintenance and are traversable by jeep-type vehicles only. The sole road extending into the interior from the coast connects Monrovia to Gbanka where one fork extends northwesterly into the Western Province and the other extends northeasterly into the Eastern Province. On the northwestern fork, a spur links Voinjama to Macenta in French Guinea. On the northeastern fork a spur extends from Gahnpa to N'Zerekare in French Guinea.

Footpaths traversing dense forests provide few clues for their identification. Where the forest canopy is broken, several stretches of the light narrow ribbon of trail may indicate its direction even if the path itself is not visible. Strangely enough in some areas the trail may be completely hidden and yet its position may be revealed. In these instances it may be identified by a line of tall trees serving as a protective cover from the hot equatorial sun.

Towns and villages are quite easily identified even in dense forest areas. These areas—cleared of vegetation and the earth hard-packed under foot—reflect considerable light and are the lightest areas on the photographs. The thatched roofs of the mud huts appear as gray and dark specks within these areas.

With little or no vertical control available to depict relief by contours, hachures are a convenient means of giving a map general topographic expression. Mountains and ridges have been so delineated after stereoscopic inspection. The occasional hachures shown within hachures indicate significant peaks and sharp ridges.

The spelling of geographic names shown on previous maps of Liberia quite often reveal the nationality of the cartographer.

The spelling of Saniquelli, Tchien, Gbarzon, etc., bear the imprints of a French map maker. Descriptive terms such as Long Reef Point, End Point, Highland Peak and others in the coastal area are the legacies of British hydrographers. Some spellings in the northwest carry the mark of the Dutch mining engineer and surveyor, Hendrick Jordense.

The Board of Geographic Names, Republic of Liberia compiled a list of geographic names to conform to a phonetic spelling of the dialects of the indigenes in the particular areas. The Board also undertook the job of the placing on these maps the geographic names of villages in the hinterland. Most of the names of features offshore and along the coastal area have been retained without change so as not to confuse users of navigational charts.

Robertsfield, about 45 miles from Monrovia, is the only modern airport in Liberia with radio and night landing facilities. It handles regularly scheduled PAA and Air France flights. A functional distinction was made between "airfields" and "airstrips"; airfields can accommodate DC-3s and are used by the planes of the Liberian National Airlines. Most of the country's airstrips are maintained by missionaries for the use of Piper Cubs and other light planes.

Descriptions of national boundaries not following physical boundaries, especially those along its northern and northwestern borders, were meager or not available. At the request of the Liberian Board of Geographic Names, these were not shown.

Previous maps of Liberia are at scales of 1:500,000 and smaller and are for the most part incomplete, inadequately controlled and compiled from several sources.

Aerial photography and other modern survey methods, such as shoran-control in this instance, provide an efficient and quick means of mapping in undeveloped areas at reasonable cost. The present series of maps show a more complete and accurate compilation of map detail than was possible heretofore and should prove to be a valuable source of information for the economic development of Liberia.