SYMPOSIUM OF INFORMATION RELATIVE TO USES OF AERIAL PHOTOGRAPHS BY GEOLOGISTS

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FOREWORD

IT IS with great pleasure that the Publication Committee presents its second of a series of articles which is devoted to a particular phase of photogrammetry. The following symposium of information relative to uses of aerial photographs by geologists is the result of the excellent work of Professor Smith. A number of years ago Professor Smith recognized the possibilities of aerial photographs in the work of the geologists, and has been an enthusiastic advocate of the use of aerial photographs in his profession.

I take this opportunity to express the thanks of the Publication Committee as well as the members of the Society to Professor Smith for accumulating the following material. I also wish to thank each individual who has contributed to this symposium. The names of the various contributors are appropriately shown on the following pages.

P. G. McCURDY
Chairman, Publication Committee

INTRODUCTION

In this issue of PHOTOGRAMMETRIC ENGINEERING, it is proposed to discuss typical ways in which aerial photos are being used by modern geologists, and to indicate the value of photos in teaching geology. Since Geology and Soil Science deal simply with different aspects of the same basic phenomena, it was considered appropriate to include one paper on the utilization of photos by soil scientists. It is hoped that the articles and discussion which follow may serve both to acquaint the aerial photographer and photogrammetrist with one of the

major applications of their work, and to inform geologists of some of the recent developments within their own field.

In the original planning of this issue, it was intended to include papers representing all branches of both basic and applied geology. Owing, however, to the limitations of time, many of the scientists from whom manuscripts were requested were unable to contribute. As a result, the scope of the issue is somewhat less broad than might be desired. It is hoped that in some future issue a supplementary series of papers, together with additional discussion, may serve to round out the topic, and provide an up-to-date, over-all picture of the rôle which aerial photos play in earth science.

THE USE OF AERIAL PHOTOGRAPHS IN SOIL MAPPING

Mark Baldwin, Howard M. Smith, and Howard W. Whitlock[1]

WITH aerial photographs in hand the soil mapper is equipped with seven-league boots! The vertical view of the picture covers far more area than earth-bound vision. It lays before one, for miles around, the farm fields, the wooded patches, roads, and streams arrayed in panoramic display. Relationships which before, at best, could only be conceived after long struggles through briars, swamps and tangled vines, are made clear at a glance.

In 1917 when the call was issued for volunteers to train as pilots and observers in the United States Army Air Force (then part of the Signal Corps) four or five men of the Soil Survey responded. They all were graduated from the "ground school" and entered the more interesting and exciting phase of training at flying fields. After the first flight or two, they began to notice the pattern on the earth below them. The highways, streams, farmsteads, and fields were perfectly obvious to any of the cadets, but the soil men looking down began to see through these features the soil pattern—the arrangement of the soil areas and boundaries—and the relationships of this pattern to the more readily visible features of the landscape. They saw these features as they had never been able to see them before. First of all was the greatly increased range of vision, whereby a visible boundary could be followed out for miles. Then there was the advantage of moving rapidly over to new locations while keeping the old ones in view. And many more features of the earth itself are visible from the vertical or bird's-eye view than from the horizontal or worm's-eye view, from the ground or fence post.

So flying, while it removed the soil surveyor from actual contact with the soil, offered exciting possibilities in the field of soil mapping. At least one of these fugitives from the Soil Survey began to sketch the landscape and the soil boundaries, while on his third or fourth flight in the early summer of 1918. It didn't go too smoothly because his efforts were diverted by the flying instructor who insisted that the cadet devote his attention to learning to fly rather than making pictures of the landscape. Also the advantage of seeing many square miles of territory at once had the disadvantage of offering the soil surveyor more features than he could handle before he was moved on at a terrific speed of 50 or 60 miles an hour. There were also difficulties with scale.

[1] Agriculture Division, Food and Agriculture Organization of the United Nations; Soil Scientist, Division of Soil Survey, Bureau of Plant Industry, Soils and Agricultural Engineering, United States Department of Agriculture; and Cartographic Engineer, Division of Soil Survey, Bureau of Plant Industry, Soils and Agricultural Engineering, United States Department of Agriculture, respectively.