

E74-10015

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Smithsonian Astrophysical Observatory

Contract NAS5-21748

Type I Progress Report July 1 - August 31, 1973

Discipline and Sub-Discipline 3. Mineral Resources, Geological Structure and Landform Surveys  
J. Lithological Surveys  
K. Structural Surveys

- a) TITLE: Mapping of the Major Structures of the African Rift System, Proposal Number 320
- b) PRINCIPAL INVESTIGATOR: Dr. Paul Mohr OT-306
- c) STATEMENT AND EXPLANATION OF ANY PROBLEMS: The following regions are still not imaged because of persistent cloud-cover: 1) lat.  $5-6\frac{1}{2}^{\circ}$ N, long.  $37-38^{\circ}$ E; 2) lat.  $1^{\circ}$ S- $1^{\circ}$ N, long.  $29-30\frac{1}{2}^{\circ}$ E; 3) lat.  $2\frac{1}{2}^{\circ}$ S- $3\frac{1}{2}^{\circ}$ S, long.  $36\frac{1}{2}-38^{\circ}$ E. Can this be remedied?

Can the area  $52-56^{\circ}$ N,  $104-110^{\circ}$ E be imaged, so that cooperative studies between rift geologists in Africa and USSR be facilitated?

- d) DISCUSSION OF ACCOMPLISHMENTS DURING PERIOD:  
Mohr has been principally engaged in compiling all ERTS-revealed lineament data on seven 1:1 million sheets covering Yemen, Ethiopia and Somali, and in relating these findings to the results of ground-based surveys.
- e) SEPARATE DISCUSSION OF SIGNIFICANT RESULTS:  
The new fault-map of the main Ethiopian rift (Di Paola, Bulletin Volcanologique vol. 36, 1973), based on ground and aerial photo compilations, generally agrees well with the writer's maps produced from ERTS-1 imagery. Characteristically, the ERTS imagery shows some of the major faults to be more extensive than realized from ground studies, though due to the angle of sun illumination some east-facing fault scarps are not easily discernible on the imagery. The Corbetti caldera, discovered by Di Paola, shows up surprisingly poorly on the imagery, and is shown to be an adjunct to an older, larger caldera now occupied by Lakes Awassa and Shallo. The lithological boundaries mapped by De Paola in the rift are difficult to discern on the ERTS-1 imagery.

(E74-10015) MAPPING OF THE MAJOR  
STRUCTURES OF THE AFRICAN RIFT SYSTEM  
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Unclas

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On the Somalian plateau, east of the rift, a denuded caldera has been identified as the source of much of the lavas of the Batu Mountains. Further south, ERTS-1 imagery amplifies the structural and lithological mapping of the Precambrian rocks of the Shakisso-Arero area (Chater & Gilboy, 1970), and of the Kenya-Ethiopia border region (Dodson & Matheson, 1969).

For the first time with some certainty, it is now possible to say that on the evidence of the ERTS-1 imagery, the Western Rift does not continue northeast beyond the Sudan-Uganda border, and is thus not to be sought in western Ethiopia.

- f) PUBLICATIONS: SAO Offprint 305-048, summarizes in corrected form all ERTS abstracts concerning the Principal Investigator's work.
- g) RECOMMENDATIONS: See section c) above.
- h) N.A.
- i) ERTS IMAGE DESCRIPTOR FORMS, FOR RETROSPECTIVE DATA:  
None.
- j) LISTING BY DATE OF DATA REQUEST FORMS, FOR RETROSPECTIVE DATA:  
None.
- k) The funds remaining are not adequate for the period of the contract. Additional funding will be needed to complete final report.