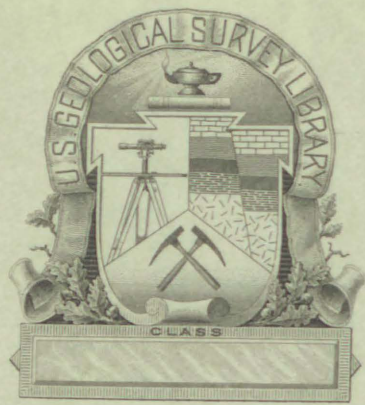


U.S. GEOLOGICAL SURVEY.

REPORTS-OPEN FILE SERIES.

No. 1725, 1972.

(200)
R290
No. 1725



(200)
R290
m 1725



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

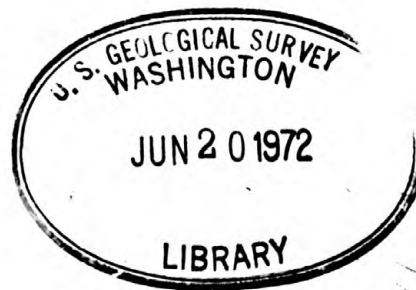
Turkey Investigation Report ✓
(IR) TU-14

✓
m
✓
ol

IRON PROSPECT NEAR KAYALAR
BALIKESIR PROVINCE, WESTERN TURKEY

by

Gerhard W. Leo, 1930-
U. S. Geological Survey



✓
U. S. Geological Survey
OPEN FILE REPORT

This report is preliminary and has
not been edited or reviewed for
conformity with Geological Survey
standards or nomenclature

1972

334684

200)
R290
no. 1725

Weld - Int. 2905

U.S. GEOLOGICAL SURVEY
WASHINGTON, D. C.
20242

For release JUNE 22, 1972:

The U.S. Geological Survey is releasing in open file the following reports. Copies are available for inspection in the Geological Survey Libraries, 1033 GSA Bldg., Washington, D.C. 20242; Bldg. 25, Federal Center, Denver, Colo. 80225; and 345 Middlefield Rd., Menlo Park, Calif. 94025. Copies are also available for inspection at: Brooks Bldg., College, Alaska 99701; 441 Federal Bldg., Juneau, Alaska 99801; 108 Skyline Bldg., 508 2nd Ave., Anchorage, Alaska 99701; 678 U.S. Court House Bldg., Spokane, Wash. 99201; 504 Custom House, San Francisco, Calif. 94111 7638 Federal Bldg., Los Angeles, Calif. 90012; 1012 Federal Bldg., Denver, Colo. 80202; and in offices of the Alaska Div. of Geological Survey, 509 Goldstein Bldg., Juneau, Alaska 99801; 323 E. 4th Ave., Anchorage, Alaska 99504; and University Ave., College, Alaska 99701. Material from which copy can be made at private expense is available in the Alaskan Mineral Resources Branch, USGS, 345 Middlefield Rd., Menlo Park, Calif. 94025.

1. The Wolverine complex, a newly discovered layered ultramafic body in the western Chugach Mountains, Alaska, by Sandra H.B. Clark. 10 p., 3 figs., 1 table.
2. Analyses of stream-sediment and rock samples from parts of the Eagle quadrangle, east-central Alaska, by Helen L. Foster and Martha E. Yount. 11 p., 2 figs., 2 tables (comprising 91 p. computer printout).
* * * * *

The following reports are also being released in open file. Copies are available for inspection at the Geological Survey Libraries, 1033 GSA Bldg., Washington, D.C. 20242; Bldg. 25, Federal Center, Denver, Colo. 80225; and 345 Middlefield Rd., Menlo Park, Calif. 94025:

3. Aeromagnetic interpretation and mineral investigations in the Bolu, Canakkale-Karabiga, Denirköy, Ezine, and Orhaneli areas of northwestern Turkey in 1968, by Herbert S. Jacobson, Ural Tümer, and Hamit Karahacıoğlu. 16 p., 3 pl., 7 figs., 2 tables.
4. Geologic reconnaissance of the Uzunpinar iron mine and vicinity, Kayseri Province, Turkey, by Patrick J. Barosh. 18 p., 5 figs.
5. Iron prospect near Kayalar, Balıkesir Province, western Turkey, by Gerhard W. Leo. 5 p., 1 fig.
6. Exploration for iron in the Sakarkaya-Çavdar area, Muğla district, Turkey, by Jacob E. Gair and Ussal Z. Çapan. 30 p., 6 figs. (2 in text, 4 in pocket), 2 tables.
7. Geology and mineral deposits of the Hekimhan-Hasançelebi iron district, Turkey, by Herbert S. Jacobson, Zeki Kendiroğlu, Celil Özdemir, Resat Boğaz, Osman Onder, and Nafis Gürel. 35 p., 4 pl., 1 fig., 6 tables.
8. Geology of the Otlukilise iron mine, Sivas Province, Turkey, by Patrick J. Barosh. 25 p., 8 figs. (1 in text, 7 in pocket).

IRON PROSPECT NEAR KAYALAR
BALIKESIR PROVINCE, WESTERN TURKEY

by

Gerhard W. Leo
U. S. Geological Survey

CONTENTS

	<u>Page</u>
INTRODUCTION.	1
GEOLOGY	1
CHEMICAL COMPOSITION.	4
SUMMARY AND CONCLUSIONS	5
REFERENCES CITED.	5

ILLUSTRATION

Figure 1.— Geologic sketch map of the Kayalar area (Balikesir Province)	2
--	---

IRON PROSPECT NEAR KAYALAR,
BALIKESIR PROVINCE, WESTERN TURKEY

By Gerhard W. Leo
U. S. Geological Survey

INTRODUCTION

In July 1968 a brief reconnaissance was made of an area about 3 km northeast of Kayalar village, Balikesir Province (1:25,000 topographic sheet 119-a3), as part of the cooperative geologic program being undertaken by the Mineral Exploration and Research Institute of Turkey (MTA) and the U. S. Geological Survey (USGS) under the auspices of the Government of Turkey and the Agency for International Development, U. S. Department of State. The coordinates of Kayalar are approximately $39^{\circ}50'30''\text{N}$, $27^{\circ}40'30''\text{E}$. This investigation was made to check a verbal report that the area contained significant iron mineralization, possibly in the form of a bedded iron deposit.

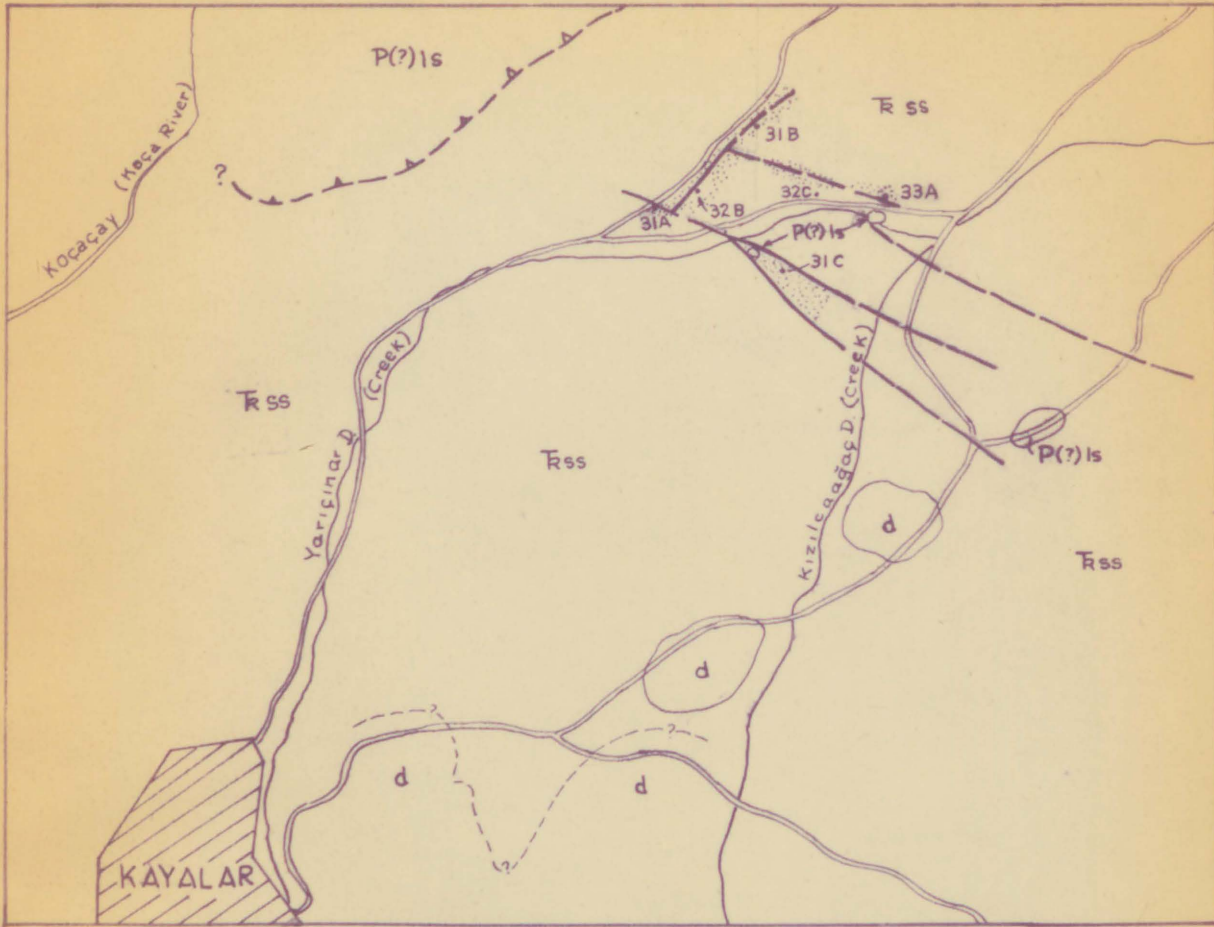
GEOLOGY

The mineralized area is entirely within coarse, tan to grayish green arkosic sandstone referred to on published maps as Triassic (Aygen, 1956). The full extent of this sandstone is unknown but it is widely exposed north of Edremit about 50 km southwest of Kayalar (Aygen, 1956; Krushensky and others, in press) and in the Samli area about 20 km east of Kayalar.

In the area of this report (fig. 1) the sandstone is cut by several faults that are evident for about 1 km, but which cannot be traced far

KAYALAR (BALIKESİR VLAYETİ) BÖLGESİNİN JEOLOJİK TASLAK HARITASI

Figure 1. GEOLOGIC SKETCH MAP OF THE KAYALAR AREA
(BALIKESİR PROVINCE)



OLÇEK : 1:25,000
Scale : 1:25,000

0 250 500 750 1000 m.

LEJAND Legend

- | | |
|---------|--|
| d | INTRUSİF (?) HORNBLEND DASİT
Intrusive (?) hornblende dacite |
| R ss | KUMTAŞI (NOKTALI KISIMLARA Si ve Fe
EMPRENYE OLMUŞTUR
Sandstone (stippled where impregnated
with Si and Fe) |
| P(?) ls | KRİSTALİN KİRECTAŞI
Crystalline limestone |

— — — — —
JEOLOJİK KONTAK; MUHTEMEL
KONTAK KESİK ÇİZGİ İLE,
FARZEDİLEN KONTAK SORU
İSARETLİ ÇİZGİ İLE GÖSTERİL-
MİŞTİR
Geologic contact, dashed where
approximate, queried where
inferred

— — — — —
FAY; MUHTEMEL FAY KESİK
ÇİZGİ İLE GÖSTERİLMİŞTİR
Fault, dashed where
approximate

— — — — —
MUHTEMEL TERS FAY
Probable thrust fault

• 32B
NUMUNE ALINAN YER
Sample location

N
MN
1° 15'
1955 dec.

20750

2

G. W. Leo

20750
G.W. Leo
Balıkesir
Kayalar
G.W. Leo
31/5/69

beyond the mineralized zone. A subsidiary northeast-trending fault forms the northern boundary of the mineralized zone, which apparently is confined entirely within the fault blocks and occupies a total area of less than 0.5 square kilometer.

The mineralized rock is silicified sandstone somewhat impregnated with iron oxide (hematite and limonite); it is hard, red-brown, and somewhat vuggy and mainly occurs as scattered blocks in the vicinity of the faults. Contacts between unsilicified and silicified sandstone, which were observed directly in only a few places, appear to be generally abrupt; locally (e.g., loc. 32B) blocks of silicified sandstone overlie outcrops of unsilicified rock. Isolated blocks of crystalline limestone (Permian?) apparently involved in the normal faulting are evidently remnants of a thrust plate (Aygen, 1956) that crops out north of the faulted area.

The silicification and iron staining are evidently related to the normal faults which apparently acted as channelways for hydrothermal solutions. The iron and silica may have been introduced by the intrusion of hornblende dacite near Kayalar, but they might also have been leached from the sandstone itself by barren hydrothermal solutions.

A section through the sandstone about 7 meters beneath the surface within the mineralized area can be seen in a northeast-trending gully which is traversed by both branches of the southwesternmost fault. Although there is ample evidence of shearing and crushing, little silicification or iron staining is present at this depth, indicating that the latter two are distinctly near-surface phenomena.

CHEMICAL COMPOSITION

Seven samples of silicified and iron-stained rock and two samples of grayish-green unsilicified sandstone were analyzed for Fe and SiO₂ by Ali Demircioglu, MTA chemist. The samples were chosen at random from scattered blocks and outcrops at six localities (see map)^{1/} in the hope of obtaining a representative selection.

The silicified and iron-stained samples contain Fe ranging from 4.8 to 11.1 percent, and all but one sample contained less than 7.5 percent Fe. These values are much too low to be of economic interest. SiO₂ values for the same samples range between 70 and 90 percent.

The two unsilicified sandstones gave values as follows: No. 32B/1, 5.7 percent Fe and 67 percent SiO₂; No. 32C, 1.7 percent Fe and 70 percent SiO₂. The iron content of 32B/1 is close to the average of the iron values of the "mineralized" samples and suggests that the iron in the "mineralized" rocks may have been leached from the original sandstone. Sample 32B/1 is also slightly magnetic and shows accessory magnetite under the microscope. Sample 32C shows less iron and also less visible magnetite. The relative distribution of magnetite within the extensive sandstone unit is not known.

^{1/} Because of the small scale of the map relative to the area studied, some map localities refer to two or more samples; e.g., sample No. 32B/1 (unsilicified) and 32B/2 (silicified) both occur within 50 meters of the location marked 32B on the map. For the same reason, the boundaries between silicified and unsilicified sandstone are somewhat schematic and approximate.

SUMMARY AND CONCLUSIONS

Silicification and iron impregnation of sandstone northeast of Kayalar have originated by near-surface hydrothermal activity in a small area of block faulting. The rocks are not a sedimentary iron deposit, and the iron content is much too low to be of economic interest. No further exploration is recommended.

REFERENCES CITED

- Aygen, Temuçin, 1956, Balya bölgesi jeolojisinin incelenmesi (Etude geologique de la region de Balya): Maden Tetkik ve Arama Enstitüsü Yayınlarından (Publications of the Turkish Mineral and Exploration Institute), ser. D., No. 11, 95 p.
- Krushensky, Richard D., Akcay, Yavuz, and Karaege, Erdogan, in press, Geology of an area east of Edremit, Biga Peninsula, northwestern Turkey: MTA Bull., foreign ed.

USGS LIBRARY-RESTON



3 1818 00077500 5