The present work is restricted to two long and laborious-ly progressing galleries which are heading for two wells, (Fig. 22), in each of which 36 inches (90 cms) is reported. The property is favourably placed near a road to dispense with mule transport. To date only one very thin stringer of coal has been encountered.

D. Mdekhenn Workings. (Fig. 6.)

The workings at Mdekhenn lie 1.5 miles (2.4 cms) to the west of Morjlaya, and it was considered likely that both properties might be worked in conjunction with with each other. The following is a general description of the occurrence.

The deposit at Mdekhenn had been exploited in the past by the Germans. It is situated 1.25 miles (2 kms) from Ras-el-Harf at an elevation of 1820 feet (560 metres) some 650 feet (200 metres) below the village. The deposit occurs in the sandstone at the foot of the Lower Cretaceous Beds, and contains the usual intermingling of pyrites as associated with Lebanese lignite.

The average width of the lignite seam as exposed is 12 inches (30 cms). It dips north-south, while the strike appears to run in a series of anticlinal and synclinal folds. At present there are two galleries being worked. One of these extends in the direction of the dip, i.e. north-south, for 30 yards. Over this distance the results are not promising from a mining point of view. This is due to a series of slip faults. The gallery travels in for a distance of 26 feet where it encounters a fault which throws the seam down 6.25 ft.
Another 26 feet further on the second downthrow is met; this has a throw of 1.5 feet. Yet another 20 feet further on a third downthrow of 4.5 feet is encountered. How far this series of slip faulting continues, it is impossible to say. Nevertheless, as exposed to date, and taking into consideration the mining capabilities of the locals, the seam is liable to cause difficulties in extracting along the strike between these faults. Should the seam assume more uniform characteristics on further advancement, it will be possible to adopt a definite scheme of extraction.

The other gallery being worked is a continuation of previous work done by the Germans. It is proceeding in an easterly direction along the strike, which as already stated, consists of a series of anticlinal and synclinal folds, the amplitude of which varies. This means that the gallery at present being worked is often in barren ground. The gallery is at present in 380 feet (117 metres) from the entrance; 195 feet (60 metres) of this was done by the Germans. This gallery can easily be connected with the one already mentioned.

Work has been carried out at Mdekhen for some months, during which only 20 tons of lignite have been extracted. Until further exploitation has been done a definite programme cannot be mapped out. The people at present working this deposit are completely ignorant of any principles of mining, and guidance is definitely necessary.
E.  Mar Youhanna Mine.

Mar Youhanna is a monastery situated below Ras-el-Harf, on the slope leading down from Bhamdoun to the Hammana river. The deposits here were amongst the earliest to be exploited in the whole of the Lebanon. Travel books describe the conditions in which the mine was worked a hundred years ago. It was worked extensively during the war of 1914 to 1918, and recently, exploratory work is continually revealing rubble embankments and a few stanchions which point to the fact that the deposit was once fairly good. The exploration work which was undertaken by the Societe de Briquetage des Matieres Combustibles has not revealed the limits of the original exploitation, nor how much
remains to be exploited. The spot is not far distant from Ras-el-Harf. Hitherto, the lignite from the mine has had to be carried by mule to the village.

Summary of Mar Youhanna.

Map Reference: 1456.2084
Altitude: 1820 feet (860 metres)
Situation: Below and N.E. of Ras-el-Harf village in a small tributary wadi on the south side of Wadi Hammana.
Distance from road at Ras-el-Harf: 1.25 miles (2kms) by mule track, and a climb of 780 feet (240 metres).
Owner: M. Dfouni holds Exploitation Permit.
Labour: 3 men.
Production: Nil.

Comment:

Recording as producing in 1835. Much evidence of old work. Stated by locals that Germans in last War prospected in the vicinity, but did not re-open old mine. Present owners opening an old gallery for prospecting purposes. Nothing to indicate success. Also no market.

2. The Region Around Abey.

As previously stated this property is the largest one as yet known in the Lebanon, and has been thoroughly examined and sampled (Fig. 23).

Location.

The village of Abey is situated 20 miles (32 kms) from Beirut and 10 miles (17 kms) to the south of Aley, at an altitude of 2760 feet (850 metres). Some 1300 feet (400 metres) below this village, at the bottom of
a ravine, accessible only by a winding mule track, there is a lignite outcrop (Map Reference 1294.2010), which can be followed over a distance of 2300 feet (700 metres).

At present, and for the past two years, during which some 7,000 tons of lignite have been extracted, the working of the mine is being conducted by the Societe de Briquetage des Matieres Combustibles, the whole of the output going to their briquetting factory at Dora, Beirut.

Nature of the Lignite Seam.

The lignite is similar in most respects to that encountered in other parts of the Lebanon, especially with regard to the amount of pyrites present, which vary from egg-shaped sizes down to fine agglomerations of grains, the latter being present everywhere. There is also a slight intermingling of schists, and sometimes a slight indication of arsenic in the pyrites. This necessitates cleaning of the run-of-mine product in some form or other before it can be put to any industrial use.

The seam has a dip to the west of 10 degrees, and as mined to date discloses an average thickness of 6 to 8 inches (15 - 20 cms) of good lignite; over short distances it widens out to 12 to 16 inches (30 - 40 cms).

The sandstone in which the lignite is interbedded, varies greatly over short distances of even 32 to 48 feet (10 - 15 metres). The face, roof and sides of a gallery when actually being mined, present a fairly hard exterior. The roof and sides, however, after exposure to moisture and air, disintegrate very rapidly, this process taking from two weeks to two months, seldom longer than two months.
There are numerous small faults and crevices present in these sandstones, necessitating the systematic use of timber, a procedure which is not being sufficiently carried out at present.

Numerous analysis have been made of Abey Lignite, the results of which are given. The following, however, are the results of a calorific survey of the mine conducted by the writer personally. The figures are the average of 21 samples taken at faces and along the sides of galleries.

**Abey "Run-of-Mine" Lignite.**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width (ins. &amp; cms)</td>
<td>9 (23)</td>
</tr>
<tr>
<td>Moisture %</td>
<td>10.6</td>
</tr>
<tr>
<td>Volatiles %</td>
<td>27.7</td>
</tr>
<tr>
<td>Fixed Carbon %</td>
<td>40.0</td>
</tr>
<tr>
<td>Ash %</td>
<td>32.3</td>
</tr>
<tr>
<td>Sulphur %</td>
<td>9.2</td>
</tr>
<tr>
<td>Calorific Value</td>
<td>8640 (4800)</td>
</tr>
</tbody>
</table>

**Note:** Washed fines recorded a humidity of 3.7%, ash 14%, sulphur 3%, and a calorific value of 3640 B.T.U.s (5300 cal/kilo).

It is considered that in sized Lump Lignite the ash and sulphur content will be lowered.

**Method of Extraction.**

Up until recently little attempt has been made to introduce a systematic method of working the deposit. Due to this haphazard mining, many areas of good coal have been lost, and the expense involved to recover them is prohibitive under local conditions. Other areas, at present being mined in a desultory manner, will have to be stopped until rendered safe.