great mass separated from the cliff below, yet
tjoined with it above.

It was quite rough, and as the ship went plung-
ing and staggering south we got a view of Lum-
burgh Head, to the west of which is Fitful Head,
both familiar to the readers of Scott’s "Pirate." Cross-
ing Lumburgh Roost, the "St. Magnus" did some pitching that I shall not attempt to de-
scribe. In the morning we went into Kirkwall and had a short interval of peace. Walls in
Orkney resemble rows of gravestones, being
made of flags set on end. Flags are one of the
exports of the islands.

Leaving the Orkneys we passed the lofty
rocks off South Ronaldsha, and crossing the
Penland Firth arrived at Wick; here the cap-
tain found it far too rough to enter the bay, so he put back to Sinclair Bay, where we landed and embarked passengers in boats, an exciting opera-
tion in the sea that was running.

Early next morning we arrived at Aberdeen,
where I found that the rest of the party (a good
working majority) were tired of tossing in the
North Sea and desired to return to Edinburg-
h by rail, a course which was accordingly adopted.

C. W.

The Tilly Foster Iron Mine.

[Abstract of notes made by the Mining Engineers of '84, M. I. T.,
during their excursion of Nov. 9, 1883]

This mine is located about two miles south
of Brewsters, N. Y., on the New York City
and Northern Railroad. Its superintendent is
Mr. Andrew Cosgriff; the mining engineer is
Lewis G. Engel, a graduate of the Columbia
School of Mines.

The ore is the magnetic oxide, $\text{Fe}_3\text{O}_4$, and is
bedded as a lenticular mass of the shape of a
meniscus, surrounded by a very hard banded
gneiss (the "country rock"), mixed with more or
less serpentine, calcite, magnesian silicates,
pyrite, and pyrrhotite. Portions of the bed had
been dislocated and folded over by faulting; the
concave side of the meniscus thus forming the
foot-wall, which has a dip of about 66°. Formerly
the mine was an open pit, but now there are three
inclined shafts, running down against the foot-
wall, two of which start from the bottom of the
old pit, while the third starts from the top of a high
point of land to the northward of the other two.

There are five levels, beginning at one hun-
dred feet, and each succeeding level one hundred
feet below the former. The entrance to the adits forming the one hundred-foot level are on
the sides of the pit forming the old mine. The
second level is about thirty-five feet below the
bottom of the old pit. The greater part of
the work appeared to be carried on in the fourth
and fifth levels, the latter of which has not as yet
been fully explored, the drift along the foot
walk and the perpendicular side drifts being
opened up at the time. Exploration and pros-
pecting are carried on by means of a No. 7
prospecting drill made by the American Dia-
mond Rock Boring Company of New York,—a
machine which will bore vertically, horizontally,
or in any direction for a distance of eight hun-
dred feet.

Weight when set up, 1,350 lbs.; weight of
heaviest piece packed for shipment, 450 lbs.;
diameter of bit, 2 inches; size of core, 1\frac{1}{8} inches;
cost, about $3,000. A perfect core of the en-
tire distance bored is registered by this machine.
The bottom of the old pit is on a level with Croton
Lake when the latter is at high-water mark, and
being situated on a peninsula jutting into the
lake, a good deal of water flows into the mine
through the interstices between the strata. In
the south shaft near the two-hundred-foot level,
a dam has been built to keep the water from
flowing to the bottom of the mine, and thus en-
tailing a greater expenditure of power in remov-
ing it. A Cornish lifting pump elevates about
forty thousand gallons of water per day from a
large "sump" near the pump shaft, to a reser-
voir on top of the hill, from whence it is al-
lowed to percolate or filter through a brick par-
tition wall into another walled compartment and
is drawn from there for use in the boilers.
Small pumps driven by compressed air force the
water from along the drifts into the main sump;
and thus the question of how deep they can go
evidently depends upon how long they can afford
to pump.