Rocks in the field

The Antrim Coast

TONY:
In the late 18th century this locality became world famous because certain geologists identified this hornfels as a basalt and they used the ammonites to actually support the idea that all igneous rocks were deposited in the sea -it actually missed the contact but it took over 50 years before the theory was debunked.

GLYNDA:
Further west along the Antrim coast there's an obvious contrast between the white rocks in the cliffs with this black rock in the foreground. The black rock is a dolerite intrusion and it's not bedding we're seeing here but sheet jointing. On the surface of the sheets there are cooling cracks formed when the magna solidified. In the distant cliffs you can make out bedding quite easily -these white rocks are sedimentary. Closer to the igneous intrusion bedding is not so clear. The white rock is chalk-a type of limestone formed from the minute skeletal remains of marine organisms. The microfossils are so small that they are not easy to make out even in a thin section. As a limestone chalk should fizz with acid -which it does! The acid reacts with the calcium carbonate releasing carbon dioxide. Also embedded in horizontal layers within the chalk are some black nodules. The material comprising these nodules doesn't fizz with acid, so it's not a carbonate rock But it does break into sharp edged fragments with a characteristic conchoidal fracture.

Individual nodules which weather out from the chalk often retain a chalky coating.
These nodules are almost pure silica and have come from the remains of other marine animals such as sponges. The nodules are composed of chert commonly called flint when found in chalk like this. Now when igneous material comes into contact with chalk -what do you expect would happen? There's a small intrusion in the cliffs behind the harbour. At the contact a band of very pale whitish grey coloured rock extends into the chalk for 20 cms or so. It's slightly different appearance is best seen by comparison with the hand specimen of chalk, which is pure white in colour. If you hit it with a hammer it sounds like a much harder rock then chalk and it breaks like a crystalline rock.. With acid it fizzes -so it's still a carbonate - although it's been recrystallized by contact with the hot igneous intrusion. We call this metamorphic rock -marble -but here the contact metamorphism is very localised as most of the country rock, the chalk, has remained unaltered.

TONY:
Evidence for an explosive volcanic eruption is a rock apparently formed from the compaction of voocanic debris. For this magna to reach the surface it had to be intruded through the crust. Initially explosive, the effect was to fragment some of the chalk, throwing the debris into the air. Close to the vent this debris settled with minimal sorting ¬like a layer of dust-with clasts of chalk -other rock fragments there's even a fossil here, all in this greenish grey matrix. Here are some c1asts of red to reddish black basalt. It's a very chaotic rock. We've actually got a thin section of this from a sample we collected earlier.

GLYNDA:
Although the rock is very weathered and it's hard to distinguish individual minerals in the rock fragments we can find some evidence of a remnant pyroclastic texture with larger fragments chaotically preserved in a very fine grained grey matrix. In many places the matrix consists of volcanic glass which shows evidence of squashing and compaction. This is because the matrix was still soft and plastic as it cooled around the larger fragments. It's possible to

identify the composition of some of these larger c1asts ¬this fragment contains tiny rounded shells and resembles very closely the specimen of chalk that you have in the home kit.

TONY:
And of course the acid test for this being chalk is? And we call this a pyroclastic rock.