

within less than half a mile of the town of Cromarty; and when fatigued with my calculations in the bank, I used to find it delightful relaxation to lay open its fish by scores, and to study their peculiarities as exhibited in their various states of keeping, until I at length became able to determine their several genera and species from even the minutest fragments. The number of ichthyolites which that deposit of itself furnished,—a patch little more than forty yards square,—seemed altogether astonishing: it supplied me with specimens at almost every visit, for ten years together; nor, though, after I left Cromarty for Edinburgh, it was often explored by geologic tourists, and by a few cultivators of science in the place, was it wholly exhausted for ten years more. The ganoids of the second age of vertebrate existence must have congregated as thickly upon that spot in the times of the Lower Old Red Sandstone, as herrings ever do now, in their season, on the best fishing-banks of Caithness or the Moray Frith. I was for some time greatly puzzled in my attempts to restore these ancient fishes, by the peculiarities of their organization. It was in vain I examined every species of fish caught by the fishermen of the place, from the dog-fish and the skate, to the herring and the mackerel. I could find in our recent fishes no such scales of enamelled bone as those which had covered the *Dipterians* and the *Celacanth*s; and no such plate-encased animals as the various species of *Coccosteus* or *Pterichthys*. On the other hand, with the exception of a double line of vertebral processes in the *Coccosteus*, I could find in the ancient fishes no internal skeleton: they had apparently worn all their bones outside, where the crustaceans wear their shells, and were furnished inside with but frameworks of perishable cartilage. It seemed somewhat strange, too, that the geologists who occasionally came my way,—some of them men of eminence,—seemed to know even less about my Old Red fishes and their peculiarities of structure, than I did myself. I had represented the various species of the deposit simply by numerals, which not a few of the specimens of my collection still retain on their faded labels; and waited on until some one should come the way learned enough