Thomson, Murray, and Buchanan,[1] dealing with the nature and origin of the marine deposits procured in the various sounding and dredging operations.

Since the return of the Challenger Expedition very many samples of marine deposits have been collected from nearly all regions of the ocean basins by the surveying vessels of the British Navy, by the telegraph ships belonging to the India-rubber, Gutta-percha, and Telegraph Works Company, and to the Telegraph Construction and Maintenance Company, and by Norwegian, Italian, French, German, and American Expeditions. The great majority of these samples have passed through our hands, and have, along with the Challenger collections, formed the material for our investigations.

In the present work we have endeavoured to point out the composition and mode of formation of marine deposits in general, as well as the distribution of the different types over the floor of the ocean. In many cases we have indicated the resemblances and differences between these deposits and certain geological formations, but we have not discussed in detail the wider geological bearings of the results arrived at from these researches. If it be remembered that, previous to the recent scientific explorations of the great ocean basins, we possessed no positive knowledge concerning the organic and mineralogical components of the deposits now forming over more than one-half of the earth's surface, the importance of the Challenger's discoveries, as to the nature of the sea-bed, on all inquiries regarding the past history of our globe will be readily appreciated.

The large amount of material at our command has enabled us to divide marine deposits into two great categories—Terrigenous Deposits and Pelagic Deposits.

The Terrigenous Deposits include those now forming along the littoral zone, in shallow water, and on the continental slopes beyond the 100-fathom line. They are, for the most part, composed of materials washed down from emerged land, the various components exhibit abundant traces of mechanical action, and the accumulation is relatively rapid. Among these terrigenous deposits it is possible to recognise an accumulation of materials analogous to those forming certain schistose rocks, shales, marls, greensands, chalks,[2] phosphatic and other limestones,[3] volcanic grits, quartzites, and sandstones of geological formations.[4]

[1] See *Proc. Roy. Soc.*, vol. xxiv., 1876

[2] The nature of the mineral particles and pebbles of the chalk, the evidences of mechanical action, the variability of the residue of the chalk, the chemical analysis, the character of the organic remains, and the position of the Cretaceous sea, all point to the white chalk being formed near shore, and not in the abysmal regions of a deep ocean like a typical Globigerina Ooze (see L. Cayeux, "La Craie du Nord de la France et la Boue a Globigérines," *Ann. Soc. géol. du Nord*, tom. xix. pp. 95–102, 1891, and other papers by the same author). The same remarks are applicable to certain calcareous and siliceous rocks of the Alps (see F. Wähner, "Aus der Urzeit unserer Kalkalpen," *Zeitschr. d. Deutschen und Oesterr. Alpenvereins*, Bd. xxii. pp. 87–124, 1891).

[3] In some terrigenous deposits there appears to be distinct evidence of the commencement of dolomitisation.

[4] The area covered by terrigenous deposits (from the coast line seaward to an average distance of about 200 miles, and down to an average depth of about two miles) has been called by Mr. Murray the Transitional Area. It covers about one-seventh, while the land surface occupies two-sevenths, and the pelagic deposits four-sevenths of the earth's surface. Mr. Murray holds that all the marine stratified rocks of the continents have in past times been laid down in regions corresponding to the Transitional Area.