

merits and its defects. The subject is one which has a singular interest to me, for I have been working out the fauna of Italy and its dependent seas, especially in relation to Vertebrata, for the last five and twenty years, and have formed a collection in which about 38,000 specimens (25,000 being fish) represent the vertebrate fauna of Italy and the seas which surround it. I soon found that although strong in Mollusca, Dr. Kobelt was weak in the knowledge of other classes of animals, and that along with solid fact" his book also contains a number of grave inaccuracies. Now I am very busy, and find that life is far too short to allow the waste of time caused by polemics; I usually, therefore, avoid them, and should certainly have passed over Dr. Kobelt's errors and omissions had not your reviewer's remarks in No. 1570 of NATURE (page 99) rendered it imperative that I also should ask you to allow me to make a few remarks. NATURE has now fully undertaken the noble task of keeping scientific investigators up to the mark as regards the general progress of knowledge, and it is not fair that it should unwittingly propagate error. Now of the several chapters of Dr. W. Kobelt's book, the poorest and the worst is by far the one (*viertes Kapitel*) which he has devoted to "Das Mittelmeer," the classic ground of the renowned labours of Edward Forbes and of so many before and after him. How ever could a German living in the land of bookworms and patient labourers in bibliography write such a chapter, and come amongst other incorrect and incongruous conclusions, to that pyramidal error that the abyssal parts of the Mediterranean are azoic? Good and learned Dr. Carpenter said something similar about twenty years ago, after the fruitless dredgings of the *Porcupine* and *Shearwater*, but he lived to know that he had been mistaken, and we discussed the very subject together at a dinner at his own house in June 1883.

It was on August 5, 1881, that I sent an express across Asinara to Porto Torres, North Sardinia, bearing a letter to the editor of NATURE in which I gave the first account of the discovery of typical representatives of the North Atlantic deep-sea fauna in the abyssal area off North-west Sardinia; on that occasion specimens of *Polycheles* (Willemsia), *Bristinga* and *Hyalonema* had been secured with the trawl (NATURE, August 18, 1881, p. 358). A few days later, from depths between 3000 and 1500 metres, I got two new forms of Macrurid fishes, so characteristic of the abyssal fauna, viz., *Chalinura mediterranea* and *Hymenoccephalus italicus*; of the former the two specimens then caught are as yet the only ones known. This was the first deep-sea campaign of the *Washington*; we were all new to such work, and yet a few weeks later, at the meeting of the Third International Geographical Congress at Venice, I was able to lay before the savants there assembled a preliminary report, in which the existence of a deep-sea fauna in the Mediterranean, similar to that of the North Atlantic, but evidently with some special features, was fully proven. Our greatest depth was then 3624 metres, between Sardinia and Sicily; thence we dredged up fourteen living animals: an Anomourous Decapod, an Annelid, and several singular small Holothuroids, as yet unstudied. The two following summers, about a month each year, were dedicated to thalassographic researches in the Mediterranean by the Italian man-of-war *Washington*, but the trawl was hardly ever used at the greater depths. The authorities of the navy, and I am sorry to add also those of the Lincei, appeared to have lost all interest in that fertile field of research. Years after, a little deep-sea trawling was done by the Austrians round about Crete; they got some good abyssals, amongst which *Bathypterois*, the singular tentacled fish; they also found the greatest depth yet recorded in the Mediterranean, over 4000 metres. The enlightened Prince of Monaco has also given a trial to some of his wonderful deep-sea traps, always with good results, but his systematic abyssal researches have all been outside our "Mittelmeer" hitherto.

I have never lost any opportunity since 1881 of doing my level best to promote the continuance of those thalassographic and especially abyssal researches, which had been so well begun by the *Washington*; my last appeal was made to the Third Italian Geographical Congress, which met at Florence last year, my proposals were adopted unanimously in the proper section, and I am beginning to hope that they may soon have a practical result.

I have not the slightest doubt that the abyssal fauna of the Mediterranean is a rich one, in which not a few novelties will turn up. I have already in my Italian collection about seventy

species of typical abyssal fish—Elaasmobranchs and Teleostei—and have, besides those already mentioned, described some very singular forms hitherto unknown, and apparently peculiar, such as *Bathophulus* and *Eretmophorus*.

After all this you will admit that it is rather sad to read in NATURE of November 30, 1899, that "the Mediterranean, as is well known, sinks in places to profoundly abyssal depths; the actually greatest depth appears to be 4400 metres; but here no living organisms have been found. It is purely azoic; the reason for the want of life is, according to the author, the want of oxygen and the abundance of carbonic acid." I should like to see the above assertion proved.

I may add that Dr. Kobelt, who is a specialist in Malacology, appears to be unacquainted with the abyssal molluscs which I dredged up from great depths in the Mediterranean, and which were described (several as new) shortly after by my lamented friend, J. Gwyn Jeffreys. And at p. 105 of his book he says that *Nephrops norvegicus* is not found in the Mediterranean. Now in 1881 I dredged up specimens from depths of 765–823 metres, in that sea, off the west end of Sicily.

Dr. Kobelt has a grim way of disposing of the Cetacea of the Mediterranean. These are much better known than he appears to be aware; I know positively that thirteen species occur, four being *Mystacoceti*; none are peculiar, and could hardly be expected to present that case, but it is of singular interest that the common porpoise (*Phocaena communis*) is certainly absent from the Mediterranean, and said to be common in the Black Sea. Our seal (*Pelagiuss monachus*) is nearly peculiar to the Mediterranean and Adriatic, where *Phoca vitulina* never occurs. This hardly looks like "an impoverished gulf of the Atlantic," as Dr. Kobelt is pleased to style our "Mittelmeer" as regards mammals. And, turning to terrestrial mammalia, what of the Mediterranean barrier *re* Mufions (*Oris musimour*) in Corsica and Sardinia; *Cervus corsicanus*, with the same peculiar distribution—these mammals are found in a wild condition nowhere else—and *Cervus dama*, wild only in Sardinia? I will allow the *Inuus candatus* as an importation, but hardly as a native product of the "Rock" of Gibraltar!

Certainly I can hardly commend Dr. Kobelt's book to the serious student of zoo-geography; and I cannot help a bitter reflection when I come to compare mentally the favourable review it has had in these pages, where a few weeks earlier a volume, of which one of the co-authors may be styled the father of zoo-geography, and is emphatically one of the most meritorious of England's zoologists, was treated in a very different style (*vide* NATURE, No. 1549, vol. ix., p. 217).

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PROF. GIGLIOLI appears to blame me for a too favourable review of Dr. Kobelt's recent book. In that review I pointed out some errors, as I thought, of inference as well as of omission: I still think however that Dr. Kobelt has produced an usefully elaborate and painstaking work, and therefore beg for a short space wherein to reply to such of Dr. Giglioli's criticisms as affect my own review.

Dr. Giglioli justly comments upon the fact that many deep-sea animals have been dredged in the Mediterranean. But, as I understand him, Dr. Kobelt does not deny this; he merely observes that the abyssal fauna of the Mediterranean is not special to that sea. Dr. Giglioli himself remarks upon the occurrence of "typical representatives of the North Atlantic deep-sea fauna," which is in accord with what Dr. Kobelt says. That there are some forms peculiar to the Mediterranean does not necessarily invalidate the justice of Dr. Kobelt's generalisation. I do not read Dr. Kobelt as saying that "the abyssal parts of the Mediterranean are azoic." How could I, considering that he gives (p. 115) two lists of deep-sea Mollusca? I understood him to mean that one particular locality of 4400 metres in depth happened to be so. In this matter I simply referred to Dr. Kobelt's statement. I neither dissented nor assented. Dr. Giglioli is no doubt right in asserting that the whales of the Mediterranean are not only not peculiar but could not be expected to be. But if the number with which he is acquainted (13) represent the entire Cetacean fauna of that sea, then Dr. Kobelt is most emphatically right in speaking of it as an impoverished gulf of the Atlantic.

THE REVIEWER.