

Time has not yet shown whether the new generation of breeders raised from selected ova of the largest trout, in their turn produce still finer ova and fry, but there can be little doubt that this will be the case.

The history of the gradual improvement of the piscicultural apparatus given in Chapters VIII. to XVII. is extremely interesting. A detailed account is contained in these chapters of the increasing amount of stock, and of the hatching operations in succeeding seasons. But enough has been said to show the character and value of the first part of the work. The second part will contain descriptions of the experiments which have been made at Howietoun since the establishment reached its present complete and efficient condition.

J. T. C.

HARMONY AND COUNTERPOINT

Elements of Harmony and Counterpoint. By F. Davenport, Professor of Harmony, &c., Royal Academy of Music. (London: Longmans, 1887.)

YEARS ago, when the laws of musical sounds, like the laws of Nature before Newton, lay hid in night, it was not unusual for clever and ingenious writers on music to invent what they called "systems of harmony." They found certain combinations and progressions in use by the best composers, and they conceived it to be their duty to explain, or account for, or justify these by some kind of imaginary natural principles, more or less fanciful, which they conjured up out of their inner consciousness, to fit the case. But, unfortunately, these writers widely disagreed among themselves as to the principles on which their theories should be based, and the result was such a mass of contradiction and confusion that the very name of theoretical harmony became a by-word and a scandal, until the Newton of musical acoustics, Helmholtz, arose, and, by explaining the real nature of musical sensations, swept away these fanciful inventions into deserved oblivion.

Among these systems, however, was one, published in 1845, by a Dr. Alfred Day, which had the great good luck to be admired and patronised by no less a personage than Sir George Macfarren, the Principal of the Royal Academy of Music. So far as we know, this admiration has not been widely shared by musicians in general; but it would be idle to ignore the great weight that such an opinion must carry, and it is this, no doubt, that has preserved for Dr. Day's work an existence which might otherwise have terminated long ago.

It is natural that Prof. Macfarren should wish this system followed at the famed institution over which he presides, and the little book before us appears to be intended as a cheap manual for the purpose. No one need object to this, for, when it comes to the practical teaching of harmony, it matters little whose system is followed so that the orthodox forms of writing are taught and recommended. That system is the best which renders this knowledge easiest to acquire. It is a feature of Dr. Day's book, that he lays down strict laws, pretty copiously and peremptorily, as to what ought or ought not to be done, and Mr. Davenport has conscientiously carried out this plan. His work bristles throughout with such rules, and we may safely say that if any

student can succeed, either with or without the professor's help, in mastering them, he ought to be competent to write very good harmony. If he is of an inquiring mind, and wants to know *why* he is strictly enjoined to do so and so, or strictly forbidden to do so and so, he should postpone his curiosity till he has finished his academical course, and in the meantime be content with the Dicta of Doctor Day.

We must do Mr. Davenport the justice to remark that he has added to the work an original feature of his own which is worthy of all praise, namely, the combination of *counterpoint* with harmony-teaching. It is the general custom to give the harmony examples in the form of pianoforte chords, and this produces the anomaly that when rules have to be stated affecting the motion of certain notes, an idea of part-writing must enter which is somewhat foreign to the general system. Our author has taken the bull by the horns, by requiring the student *ab initio* to write his harmony in separate parts, putting each part on a separate line with its proper clefs. This is an excellent idea. Counterpoint is the highest and most perfect style of musical writing, but it has been much neglected in late days, and Mr. Davenport has hit upon a happy mode of encouraging its cultivation, which cannot fail to benefit his pupils.

PEARLS AND PEARLING LIFE

Pearls and Pearl-ling Life. By Edwin W. Streeter, F.R.G.S. (London: George Bell and Sons, 1886.)

THE book before us, according to the preface, and as far as we are aware, is the only work in the English language which is entirely devoted to the history of pearls. The introductory chapter is immediately followed by one which gives a brief historical account of pearls in connection with India, China, Persia, Palestine, Egypt, Ancient Greece and Italy, and Europe in the Middle Ages. This is succeeded by a *résumé* of the ancient ideas respecting the origin and supposed medicinal qualities of pearls, and by a few words on "breeding" pearls. The next chapter treats of the different kinds of pearl-forming mollusks, both marine and fluviatile. The writer then gives an account of the true mother-of-pearl shell, describing its geographical distribution, the different varieties, its structure, the parasites found within the shells, and their external enemies, their method of getting rid of extraneous substances (stones, small shells, &c.) accidentally introduced within the valves of the shell, and the uses to which the mother-of-pearl is put. The sixth chapter, although headed "The Origin and Formation of Pearls," also refers to the different kinds, such as *bouton* pearls, *baroque* pearls, and *coq de perle*, the mode of life of the oyster, the positions in which pearls are found, &c. It also treats of the qualities which regulate the value of pearls. The next chapter gives a short account of the Sooloo Archipelago, the natives as pearl-divers, and their method of dredging. Then follows a good description of the fisheries of North-West Australia and Torres Strait, and this is succeeded by an interesting chapter entitled "Pearling Life at the Present Day," which is practically descriptive of pearling expeditions made by Mr. Streeter's vessel, the *Sree Pas Sair*, from Singapore

to the North-West Australian coast and the Sooloo Archipelago.

Chapter XI. is devoted to a condensed account of the pearl-fisheries of Ceylon and Southern India, and this is followed by a *résumé* of what is known respecting the fisheries in the Persian Gulf, the Red Sea, on the west coast of North America, and at the West Indies. Pearls produced by shells which inhabit the rivers and lakes of Great Britain and foreign countries are described in Chapter XIV., and the artificial production of pearls by the Chinese is also here referred to. The different kinds of coloured pearls, and the mollusks which produce them, are then treated of. In the succeeding chapter the most famous pearls of both ancient and modern times are recounted, and the immense sums at which some of them were valued are stated. Chapter XVII. gives the history of the remarkable cluster of pearls known as "the great Southern Cross pearl," which was exhibited in the West Australian Court of the Colonial and Indian Exhibition, and valued by the owners at 10,000*l.* The next and concluding chapter is devoted to the value of pearls, and shows how their worth has varied in this country at different periods from 1671 to the present time.

A map is then introduced showing the principal pearling regions. In an appendix, the works bearing on the subject which have been consulted by the author are enumerated, and a full index completes the volume.

Mr. Streeter has brought together a large amount of information which will be of interest to the general reader, for whom especially, and not for the scientific, the work has been written. The most original material is comprised in the part extending from the seventh to the tenth chapter. The chapter devoted to the Sooloo Archipelago contains some details which, although interesting in themselves, are rather foreign to the subject of the work. The same observation applies to the account of the constellation *Crux Australis*, or Southern Cross, introduced in the seventeenth chapter.

As far as we have noticed, the various opinions and statements set forth in the work are mostly accurate. It may, however, be questioned whether "there is perhaps no instinct implanted in the human breast more powerful than the love of admiration," for is not that of self-preservation supposed to reign supreme? We would point out that the term *Lamellibranchiata* is now superseded by that of *Pelecypoda*, and with good and sufficient reasons is adopted in the latest and best manuals on conchology. The bathymetrical range of bivalves far exceeds the stated limit—200 fathoms—specimens having been obtained by the *Challenger* and other deep-sea exploring expeditions in depths ranging as low down as 2900 fathoms.

The book is printed in good legible type upon toned paper, but the pictorial portion mars the rest. The plates illustrating the *Malleus*, the *Meleagrina*, the *Unio*, the *Pinna*, the *Strombus*, and the *Turbinella* are simply execrable. They are printed upon a fearful black ground (one almost expects to see "Sacred to the memory of," &c.), inclosed by a thin white line with ornamental corners, and seem to us to have a most common appearance. We cannot see one redeeming feature in them, the drawing and colouring of the shells being equally bad. If another edition is called for, fresh and accurate illustrations should be provided.

E. A. S.

OUR BOOK SHELF

The Definitions of Euclid, with Explanations and Exercises, and an Appendix of Exercises on the First Book. By R. Webb, M.A. Pp. 48. (London: G. Bell and Sons, 1886.)

THERE are some good points in this little book which will make it a useful help in many cases, especially with backward and dull pupils. The explanations are clear and precise; the exercises are very simple, and aim chiefly at insuring that the pupil really masters the idea involved in the definition illustrated; and good diagrams are supplied. We are sceptical, however, as to the advisability of representing "each of two or more lines which are parallel to one another by two straight lines close together." This is put forward as an assistance to the memory, but the assistance, such as it is, may be very dearly purchased.

The deductions at the end of the volume—three or four on each proposition of Euclid, Book I.—are nearly all very easy; they do not require any knowledge of propositions subsequent to the ones to which they are attached.

Berättelse om en Resa til Grönland. ("Narrative of an Expedition to Greenland.") By Nils O. Holst. (Stockholm: Norstedt und Söner, 1886.)

DR. HOLST'S object in visiting Greenland was to investigate the phenomena of glacial action as they are manifested in the varied geological formations of the Arctic regions, and to secure materials which might help to elucidate many of the questions still needing solution in regard to the Ice Age in Europe.

Having obtained permission from the Swedish King to absent himself from his labours in connection with the Swedish Geological Surveys, and having been allowed by the Royal Danish Greenland Trading Company—generally very chary of granting similar favours—to make the voyage in one of their ships, he embarked at Copenhagen on April 8, 1881, in the *Peru*, which after thirty-nine days sighted the west coast of Greenland. Here he found himself suddenly brought into immediate contact with the ice-formations which he had come so far to study, for the pack-ice, which is annually brought by the Arctic current to the coasts of Greenland between the months of March and September, was so unusually dense in that year that it required ten days' cautious navigation to penetrate the ice—which, with a depth of 10 feet and more, was in many parts from 8 to 10 miles in width—and to reach safe anchoring-ground. This was at length found at Smalle, in 61° 32' N. lat., far to the north-west of Julianehåb, for which the *Peru* was bound, and there Dr. Holst left the ship and engaged a native boat to carry him to the mouth of Arsuksfjord, and to the settlement of Tigssaluk, where he had the opportunity of examining several of the "horse-shoe" moraines described by Hornerup, and comparing the land and water ice-sheets with their respective crevasses, glaciers, packs, and floes, besides making as complete a geological survey of the coast which he visited as time and circumstances permitted. In the course of these expeditions he ascended several of the characteristic so-called "nunatakor," or bare fjeld-tops, some of which are between 3000 and 4000 feet in height. On these isolated hill-tops were found, amongst other plants, various Cladonias, Silenes, Cetrarias, and Luzulas, besides *Rhododendron lapponicum*, *Nephroma arcticum*, &c.

Dr. Holst was disappointed in his expectation of examining the kryolite mines of Ivigtut, orders having been received from headquarters in Copenhagen that strangers should not be allowed to see the works, but he was able to determine the geological character of the district, and the conditions under which the mineral is found. According to him, the predominant rock is a grey, finely-