the pier belonging to the Scripps Institution at La Jolla. This point is about 1,000 feet from shore and the water is near thirty feet deep.

While taking my plankton collection at about 7:25 a. m., April 14, 1923, I heard a splash near by. Turning, I saw about one hundred feet distant a swirl in the water like that made by a California sea lion. A moment later a long, slender, compressed tail (about three feet long) flashed above the surface and lashed about like a coach whip. It evidently belonged to some shark-like creature with which I was not acquainted. This exhibit was quickly repeated once. The body was not visible at all.

At about 7:45, while draining some water through my filtration net I saw about fifty feet from the pier what appeared *at first* to be a "soup fin shark" (*Galcus zyopterus*). It was coming diagonally toward the surface and swimming rapidly. Almost immediately I noticed a small fish (possibly California smelt, *Atherinopsis californicus*, about ten inches long) frantically swimming just in front. A moment later the pursuer, a six-foot thresher shark, passed partly ahead of the victim (probably half its own length) when it turned quickly and gave the coach-whip lash with the tail which I had seen before. The victim was much confused, if not actually injured by the whiplike movement, which seemed to be very accurately aimed. The whip stroke was instantly repeated with very confusing speed, and it then became evident that the victim was seriously injured. It was, however, almost under the drip from my net, at which the shark was apparently frightened. The shark darted away and was not seen again. The victim sank, swimming feebly, then came to the surface and lay on its side awhile. Then it struggled feebly with head at surface, gasping. Finally it sank again until out of sight and was not seen again.

I was much impressed with the speed and skill with which the shark worked and with the accuracy shown in its strokes at a single flying target.

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ASYMMETRICAL ORATORY

IN the work of supervising class-room teachers during many years and in visiting class rooms in different parts of the country, I have frequently noted phenomena analogous to those described by Dr. W. Gilman Thompson (SCIENCE, March 16, 1923) as "right- and left-handedness in speakers."

Many teachers, especially when the class is large, focus their service upon a limited portion of the room to the almost complete neglect of the pupils in the marginal fringe. Whenever I brought this fact to the attention of teachers, I found that they were themselves unaware of it. On the other hand, I have met teachers who were aware of this tendency in themselves, and who attempted to counteract it by means of some mechanical device, such as seating plan or roll book, etc., to insure an equitable distribution of attention to all individuals.

The use of the right or left hand and arm to release the emotional strain for which the voice alone is not an adequate outlet may account for the asymmetrical presentation in the case of public speakers and orators. From my observation in schools I am inclined to attribute the limitation to some irregularity of vision. In many cases it is possible to detect deficient vision on the part of pupils by their posture and address.

This matter deserves more intensive and systematic study, both for the improvement of school-room technique and for the art of public speaking.

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QUOTATIONS

MEDICAL PROGRESS

"EMOTIONAL tension," Sir Almroth Wright declared in a recent lecture on vaccination, "is intolerant of any intellectual *impasse*." He was describing in outline the steps by which modern medicine has progressed towards a clearer knowledge of disease and of the mechanism of the body's protection against disease. Hypotheses are always tentative; of the best of them it may be said that, in a sense, they are made to be broken. Thus it was "'the pain in the mind,' which is felt when one is appealed to and is powerless," to quote Sir Almroth again, which led Pasteur to revise his first theory of vaccination and so to achieve his great triumph over hydrophobia. Last week, at St. Mary's Hospital, Professor Dreyer, of Oxford, offered yet another extension of knowledge which is the outcome of revised opinions and changed ideas. His new treatment of tuberculosis, whether ultimately it stands or falls, is the last link in a chain extending back to Jenner. The chain is continuous, but its links are not, if the metaphor may be extended, of the same shape nor even of the same metal. In a series of monographs, of which we present some account to-day, Sir Almroth Wright has recently outlined his own revised opinions on the subject of vaccination against disease. These differ in many important respects from the views this pioneer held when he set himself to perfect the method of preventive inoculation against typhoid fever, which stood the world in so great stead during the years of the war. Sir Almroth no longer believes that our bodies elaborate a special and specific antidote against each germ which attacks them. Rather he takes the view that there is stored up in the white cells of the blood

a common stock of antidote which can be released very swiftly and which is capable of inflicting death on most of our microbic foes.

These are revolutionary opinions and it would be idle to pretend that, at present, they meet with general acceptance. Their importance, however, can not be disputed. Nor is it likely that the "pain in the mind" which gave them birth will suffer them to remain without the sustenance of continuous experimental proof. Vaccination is now fighting for first place among the weapons of cure. Thanks to Sir Almroth Wright, Professor Dreyer and others possessed of the same temper of mind, it has literally forced itself on the world. Failure in more than one direction has already been changed into conspicuous success; no failure has been accepted as inevitable or irremediable. It may be that this urgent spirit is about to win its greatest triumphs and that, as Mr. Neville Chamberlain suggested at Birmingham on Saturday, a new vista of hope is opening before our eyes. In any case the future is big with possibility, inasmuch as many minds in the scientific world at this time are held in that "emotional tension" from which all progress and discovery proceeds.—*The London Times.*

SCIENTIFIC BOOKS

The Life of Sir Ernest Shackleton, C.V.O., O.B.E. (Mil.), LL. D., with many illustrations. By HUGH ROBERT MILL, Heinemann, Ltd., London, 1923, pp. 312.

THAT truth may be stranger than fiction is occasionally proven in the career of a remarkable man, but seldom more strikingly than in the life of Sir Ernest Shackleton, the Antarctic explorer, whose sudden death so profoundly moved the entire civilized world. This account of his life by Dr. Mill, which is sponsored by Lady Shackleton, if we except the rather dull Part One, which deals with Shackleton's boyhood and youth, is a romance which grips the reader and fastens his attention to the very end.

Even more, perhaps, than others, readers already familiar with Sir Ernest's own narratives of his expeditions ("The Heart of the Antarctic" and "South") will here see the explorer in a new light. In this intimate portrayal by his friend Mill, Shackleton stands out not only as perhaps the best exponent of British pluck and endurance, but as the idealist with a strong passion for poetry—for the lofty sentiments of Browning, Tennyson and Wordsworth even more than for the strong liquor of Kipling and Service. A few stanzas from the hero's favorites have been inserted with rare skill at the headings of chapters. On occasion Sir Ernest wooed the muse himself and not wholly without success, as the following lines show, dedicated to the sailors who were his devoted companions in so many adventures:

> But since that vision left me
> I have looked on those sailor men
> As worthy the brightest idyll
> That poet could ever pen.

The biographer of Shackleton was well chosen, for Dr. Mill is a foremost authority on the history of Antarctic exploration as well as a geographer of distinction, and his intimate friendship for the explorer extended over the entire period of the latter's explorations. Attachment for his friend has not, however, blinded Dr. Mill to the fatal optimism which in Shackleton's business ventures seems to have lacked that fertility of resource held in check by a well-ordered judgment which in his exploring expeditions amounted almost to genius.

As a boy and in early youth Shackleton showed apparently no indication of the remarkable powers which in maturer years were to make him stand forth as one of the dominant figures in all polar exploration, and it is this which accounts for the dullness of the first part of the book. Shackleton was a boy of good ideals, quite religious, and of poetic sentiments. At Dulwich College, which he attended, near his home in Ireland, he made no strong impression either upon his teachers or upon his mates. Returning nineteen years after leaving college to preside at the award of prizes, he delighted the boys when he said that he had "never been so near a Dulwich prize before."

At sixteen Shackleton went to sea as an apprentice, and in the hard life of the sailing ships of the time rose in eleven years to the rank of second mate. Of conscientious scruples and of clean habits, he had little real fellowship with the rough sailors whose respect and even whose love and affection he later commanded in so remarkable a degree. A glimpse of what was in the heart of the young man we learn from something which he wrote when twenty-four:

> I would attain but the goal is that to which Aprile yearned. What can I call success? A few years' praise from those around and then—down to the grave with the knowledge that the best thing has been missed unless the world's success brings that to pass, and for me it seems a long ways off. . . .

Who, from anything recorded in the earlier chapters, would have suspected there was to come the hero who on his first independent polar expedition threw away a portion of the warm clothing so as to carry more food and by a supreme effort in the last étapes pushed nearer the goal; or that here was the leader of the forlorn hope steering a little whale-boat across eight hundred miles of the stormiest seas of the world to achieve the rescue of his party marooned on Ele-