THURSDAY, MARCH 27, 1873

UNIVERSITY OARS

I.

WE have, not without motive, adopted the title of Dr. Morgan's book,*—so opportunely timed in its issue by its University publishers—as the heading for some considerations connected with the coming river "Derby;" for we propose to pass in review the leading features of the Hygienic value of these contests, which are claiming and receiving from year to year a growing importance, into which the book itself is an exhaustive inquiry.

Many a strong hand will tremble as it lifts this book for the first time, and many an eye will glisten with pleasure or grow dim with regret as it scans its lists and tables and reads the revelations made therein. For what do they tell—and tell too with a rare fulness and circumstantiality? All particulars as to the health, past and present, of the Oarsmen of both Universities who have rowed in the annual matches during the last forty years; that is, from the time of their organisation up to the last race rowed before the author began collecting the materials for his book. Year by year the crews are formed and the races rowed. Year by year the races pass and are forgotten, and the crews disappear and are *not* forgotten, although they may pass away from our sight. What has become of the old Oarsmen, the friends and favourites of other days? Are they "doing duty" in peaceful country parishes, or in crowded cities at home? or have they venturously gone forth to new lands to seek for more genial employments than the old one yields? What are they doing now? how fares it with them? and above all, have they suffered in heart or brain, in nerve or lung, from their old practice at the oar? The ample lists in Dr. Morgan's book, his own ably written pages, and the liberal extracts from his correspondents' answers to his queries—his correspondents being the oarsmen themselves and his queries being with sole reference to their health and bodily condition—tell us all: tell us where they are, what they are doing, what they did when with us and how they did it; and, in their own language, tell with characteristic frankness, and in words which we can still recognise as their old modes of expression, what they think and believe for or against their old favourite pastime. All write cheerily, and all to a man almost speak with prideful remembrance of their work at the oar, and the good they have derived from it. From Bengal writes McQueen:—"I am now a stout man, weighing fifteen stone, but able to be in the saddle all day without fatigue, or if necessary walk my ten or fifteen miles without any distress." We wonder if he still possess the same hand-power that he had in his youth? He had simply the strongest hand and wrist we have ever known, and never did we place our own palm in his without setting our teeth close, and subjecting the member when set free to a gentle manipulation, to restore circulation and revive feeling in its flattened digits. His was the true Herculean build. Nind writes from Queensland on "Since taking my degree in 1855 my constitution has been put to the test in many climates, for I have lived in Canada, on the west coast of America, and in Australia, and I can safely aver that I never have in trying circumstances found a failure of physical power; and that when hard pressed by fatigue and want of food, the recollection of the endurance developed by rowing and other athletics gave me fresh spirit and encouragement." And yet Nind was not naturally a powerful man. His frame was the very antithesis to that of McQueen. Those who remember him as he first came to the University will recall his exquisitely moulded features, almost feminine in their softness and sweetness of expression. Schneider writes from New Zealand:—"I may state that so far as I am concerned, I am able to discover no particular symptoms either good, bad, or indifferent specially attributable to rowing. . . . . I now come to what I believe to be the chief if not the only real danger attendant upon Boat-Racing, and that is the violent strain upon the action of the heart caused by rowing a rapid stroke and exerting every energy to maintain the same to the end of the race."

Who among us could argue the matter more wisely? These are bright and pleasant pictures, but like all other pictures, they have their dark side. In the lists of Oarsmen certain names are printed in italics—not many, thank God!—a small percentage only. These are they who have rowed out their life-race; who have for ever passed out from their period of training and of trial. They rise before our mind's eye as we first knew them. Brewster's magnificent form towering half a head above his stalwart shipmates. Men are all wise after the events; and we hear now of those who always doubted his real strength and stamina, and point to his untimely end as evidence of their own penetration. "Invalided from his regiment, caught cold by returning wet from a Brighton Volunteer Review: died from its effects." Polehampton, the chivalrous, the gentle, the brave! "Decorated while at college with the Royal Humane Society's Medal for saving a companion from drowning at his own imminent peril. Shot through the body at Lucknow—and died of cholera when attending to his comrades stricken by the same malady." The very career he would have marked out for himself, had it been left to his hand to trace it! Hughes, the accomplished, the frank, the manly—the very nature that, speaking in our love and in our pride, we emphatically style the beau-ideal of an English gentleman—"died last year of inflammation of the lungs." Here our personal reminiscences of old oarsmen must cease.

For many a long year strange tales of the risks and dangers of rowing, or rather of boat-racing, have had a floating existence in the Universities, and gaining strength and circumstantiality by time and repetition, have extended to wider circles. While the old tales lived and held their own, other and more startling legends sprang up, and also grew into importance, legends so alarming, and related with such circumstantial detail, that the most sceptical began to think that "there must be something in it." Whole crews, it was stated, had been swept off in a few brief years by their terrible struggles and efforts at the oar. This feeling of uneasiness, if not of absolute alarm, attained a sort of climax a few years ago by the letters of an eminent surgeon, published in the *Times*.

* "University Oars." By John Ed. Morgan, M.A. Oxon, F.R.C.P. (Macmillan, 1873.)

For reasons which seemed to his professional judgment sufficient, he took the side of the alarmists, and pronounced an opinion, strongly expressed, against boat-racing as now practised. These letters were answered with more or less ability by votaries of the oar, men then actively engaged in rowing, or who had recently been so. The controversy lasted for some time, and at last rather died out, or was allowed to drop, than brought to any satisfactory conclusion by the arguments or proofs advanced on either side. By the opponents of boat-racing the case was opened rather unguardedly by statements requiring a stronger array of facts than could be brought to support them when the call for proofs was made; by its defenders was met by the somewhat blunt rejoinder, "You don't know anything about it; you never lifted an oar in your life." The former forgetting that there is nothing so difficult to overcome as enthusiasm, *esprit de corps*, and, perhaps, prejudice; the latter forgetting that the effects of certain modes of exertion on certain organs and tissues of the human body may be sagely divined by a skilful and experienced physician or surgeon, without his ever having in his own person practically undergone such exertion.

As we have said, the argument dropped rather than was brought to any satisfactory conclusion, and if each side did not claim the victory, each stoutly denied that the other had won. Unto this day do we hear alarms sounded with reference to these races, again does paterfamilias feel nervous qualms at the intelligence that his son has betaken himself to the river. Again do non-rowing men console themselves for the want of river distinctions by the thought of their exemption from its risks and liabilities, and again do rowing men enjoy the *éclat* of having greatly dared for the reputation of their Colleges and University, with the secret conviction and comfort that the dangers they have run have been very slight indeed.

It was to close this open question for ever, and settle once for all this standing dispute which has many scientific aspects of great interest, that Dr. Morgan undertook the present work, recognising evidently to the full the standpoint selected by the disputants in the controversy, the one, their practical knowledge as experienced oarsmen, the other, his theoretical knowledge as a scientific surgeon; for, as the author informs us, his qualifications for the task are twofold:—

"As a physician to a large hospital, I have necessarily enjoyed large opportunities of gaining an insight into the laws which regulate our health, while my rowing experience began at Shrewsbury (where I spent many a pleasant hour on the Severn), and was matured at University College, Oxford, where I was for three years Captain of the John +, a boat which has often played a prominent part in the struggles on the Isis, and which has served as the training school for no fewer than ten of the crews which during the last thirty years have won the University Fours."

These qualifications certainly seem adequate to the task, and the plan pursued by Dr. Morgan also seems the best possible, albeit entailing enormous labour on, and demanding vast patience from, him. This plan was simply to institute a strict and exhaustive search after all the men who have rowed in these inter-University contests; to track them, as it were, to whatever part of the world they may have gone; this done, to get their own written testimony, if alive, and that of their friends, if dead, as to whether the part they played in these contests entailed any after evil results upon their constitutions and frames, and (if any) their nature and extent.

Considering that more than forty years have elapsed since the commencement of these friendly contests, and that between the years 1829-1869 twenty-six races have been rowed, giving for the crews of both Universities, and allowing for men who have rowed in more than one race, the gross number of 294 men, the task was a formidable one; but, we must add, has been as ably conducted to its conclusion as it was resolutely undertaken. The author has ascertained that out of these 294 men 245 are still living—39 having died: the time of their death and the ailment of which they died are carefully given by the author, and to this point we will return. He next tabulates the following results elicited by his inquiries:—

Benefited by rowing	. . .	115
Uninjured „	. . .	162
Injured „	. . .	17

The *benefits* derived are somewhat vaguely stated, as indeed was to be expected when almost the only benefits that could be reasonably derived from such pursuits would be of a *general* nature; such as increase of strength and stamina, increase of energy to undertake, increase of power to undergo, physical exertion; increase of fortitude to encounter and to submit to trials and privations and disappointments. A goodly list of benefits when critically examined. *The uninjured* are those who in their replies to the author's queries state *negatively* the results of rowing upon their constitutions and frames; or, in the author's language, who merely say in general terms "that they never felt any inconvenience from rowing;" while the *injured* are they who state with less or more distinctness that their exertions proved harmful.

We must confess that this last item in the bill, the 17 injured, is at first sight a little startling, and so it must, we think, have appeared to the author, for he very carefully and minutely examines the cases so recorded, and some, we think, successfully dismisses as unreal; while others, we fear it must be candidly avowed, must remain as *bonâ fide* instances of injury. But is this a matter to be wondered at when the number of men who had been so engaged is taken into consideration? Is there any other pastime or pursuit in which grown men can take part, such as draws forth at the same time their bodily power and keenest emulations, which will yield a smaller percentage of evil? Would the hunting-field, would the foot-ball field, or even the cricket-field, if closely scrutinised?

The author tells us that during his inquiries on this subject he has written over two thousand letters. We can well believe it, knowing how unwilling many men are to reply to personal inquiries, and specially so when the inquirer asks after personal ailments. He has not however done himself justice in not giving us in his book a specimen of his letters addressed to his scattered correspondents; for in all cases of dispute, and contested evidence, it is always a matter of objection if the question as put indicates or leads up to the sort of answer desired; and when, as has been already said, scepticism on one side and *esprit de corps* on the other so strongly prevails, doubts may be entertained of the accuracy of some of

the statements made in the correspondents' replies. But we think that it will be admitted that as a whole those replies are eminently satisfactory.

A circumstance quite noteworthy, however, strikes the reader who scrutinises the lists as tabulated recording the instances of *injured*, and we would be glad to hear some explanation or interpretation of what at present seems inexplicable. Thus out of the first six races only three men are recorded as injured, while out of the next four races nine men are so recorded, five being mentioned in one race—that of 1845—and two more in the race of the following year. Again occurs a period of comparative immunity from injury, only one case being instanced in the next seven races. Once more is the order changed, for in the following four races four men are recorded as injured, while in the five remaining races of the series no injury whatever seems to have been sustained. The author does not seem to have instituted any inquiry on this point, yet surely it is one worth investigation, seeing that it is this very matter of liability to injury which is the sole subject of dispute, to settle which is the avowed object of his book. Was this injury-rate affected by the mode of training of the crews, the physical calibre or age of the individual men composing them, by the severity of the contest itself, or by the character of the season when the men trained and rowed?

ARCHIBALD MACLAREN

THOMSON & TAIT'S NATURAL PHILOSOPHY

Elements of Natural Philosophy. By Professors Sir W. Thomson and P. G. Tait. Clarendon Press Series. (Macmillan and Co., 1873.)

NATURAL Philosophy, which is the good old English name for what is now called Physical Science, has been long taught in two very different ways. One method is to begin by giving the student a thorough training in pure mathematics, so that when dynamical relations are afterwards presented to him in the form of mathematical equations, he at once appreciates the language, if not the ideas, of the new subject. The progress of science, according to this method, consists in bringing the different branches of science in succession under the power of the calculus. When this has been done for any particular science, it becomes in the estimation of the mathematician like an Alpine peak which has been scaled, retaining little to reward original explorers, though perhaps still of some use, as furnishing occupation to professional guides.

The other method of diffusing physical science is to render the senses familiar with physical phenomena, and the ear with the language of science, till the student becomes at length able both to perform and to describe experiments of his own. The investigator of this type is in no danger of having no more worlds to conquer, for he can always go back to his former measurements, and carry them forward to another place of decimals.

Each of these types of men of science is of service in the great work of subduing the earth to our use, but neither of them can fully accomplish the still greater work of strengthening their reason and developing new powers of thought. The pure mathematician endeavours to transfer the actual effort of thought from the natural phenomena to the symbols of his equations, and the pure experimentalist is apt to spend so much of his mental energy on matters of detail and calculation, that he has hardly any left for the higher forms of thought. Both of them are allowing themselves to acquire an unfruitful familiarity with the facts of nature, without taking advantage of the opportunity of awakening those powers of thought which each fresh revelation of nature is fitted to call forth.

There is, however, a third method of cultivating physical science, in which each department in turn is regarded, not merely as a collection of facts to be co-ordinated by means of the formulæ laid up in store by the pure mathematicians, but as itself a new mathesis by which new ideas may be developed.

Every science must have its fundamental ideas—modes of thought by which the process of our minds is brought into the most complete harmony with the process of nature—and these ideas have not attained their most perfect form as long as they are clothed with the imagery, not of the phenomena of the science itself, but of the machinery with which mathematicians have been accustomed to work problems about pure quantities.

Poinsôt has pointed out several of his dynamical investigations as instances of the advantage of keeping before the mind the things themselves rather than arbitrary symbols of them; and the mastery which Gauss displayed over every subject which he handled is, as he said himself, due to the fact that he never allowed himself to make a single step, without forming a distinct idea of the result of that step.

The book before us shows that the Professors of Natural Philosophy at Glasgow and Edinburgh have adopted this third method of diffusing physical science. It appears from their preface that it has been since 1863 a text-book in their classes, and that it is designed for use in schools and in the junior classes in Universities. The book is therefore primarily intended for students whose mathematical training has not been carried beyond the most elementary stage.

The matter of the book however bears but small resemblance to that of the treatises usually put into the hands of such students. We are very soon introduced to the combination of harmonic motions, to irratational strains, to Hamilton's characteristic function, &c., and in every case the reasoning is conducted by means of dynamical ideas, and not by making use of the analysis of pure quantity.

The student, if he has the opportunity of continuing his mathematical studies, may do so with greater relish when he is able to see in the mathematical equations the symbols of ideas which have been already presented to his mind in the more vivid colouring of dynamical phenomena. The differential calculus, for example, is at once recognised as the method of reasoning applicable to quantities in a state of continuous change. This is Newton's conception of Fluxions, and all attempts to banish the ideas of time and motion from the mind must fail, since continuity cannot be conceived by us except by following in imagination the course of a point which continues to exist while it moves in space.

The arrangement of the book differs from that which has hitherto been adopted in text-books. It has been