

THE RELATIONS OF ANALYSIS AND MATHEMATICAL PHYSICS.*

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I.

DOUBTLESS you are often asked what is the utility of mathematics and whether its nicely constructed theories, drawn entirely from the mind, are not artificial products of our caprice.

Among the persons who ask this question, I must make a distinction. The practical class demand of us nothing but means of getting money. These do not deserve to be answered. Rather ought it to be demanded of them what is the good of accumulating so much wealth and whether, in order to have time for its acquisition, it is necessary to neglect art and science, which alone render the soul capable of enjoying it,

Et, propter vitam, vivendi perdere causas.

Moreover, a science produced with a view single to its applications is impossible; truths are fruitful only if they are concatenated; if we cleave to those only of which we expect an immediate result, the connecting links will be lacking, and there will be no longer a chain.

The men who are most disdainful of theory find therein, without suspecting it, a daily aliment. Were they deprived of this aliment, progress would quickly be arrested, and we should very soon settle into Chinese immobility.

But we have sufficiently occupied ourselves with the uncompromising practitioners; besides these there are those who are curious about Nature only and who ask us if we are in position to help them to a better comprehension of her. In response we have only to show them two monuments, already rough-hewn, celestial mechanics and mathematical physics. They would doubtless concede that these monuments are well worth the labor they have cost. But this is not enough.

Mathematics has a triple end. It should furnish an instrument for the study of nature. Furthermore, it has

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