

investigation of principles, and the latter in turning these principles to account.

To the man who learns Mathematics chiefly with a view to its use in his profession as an engineer, a navigator, or a surveyor, the practical part is of most importance,—it is more needful for him to be expert at figuring and ready at the application of his rules than to be able to trace the rules to philosophical principles.

On the other hand, it seems accordant with the spirit and design of a University to cultivate those portions of the science which involve the exercise of philosophical thought—to trace the reasons of rules instead of adopting them as the practical man does, on the mere authority of established custom. Moreover it will be found that familiarity with the principles of the science is an invaluable preparative for acquiring the practice, and enables a person to understand and remember, on first hearing, a rule which to the unscientific man would be immensely difficult. The practical part can be readily acquired by practice when once the theory is understood; but when a person has allowed his mind to harden into maturity before giving his attention to the principles, he will probably find that he is too old to learn them, and that there is nothing for him but to remain the drudge that he has begun.

Still a certain amount of practical work is necessary for rightly understanding the theory; and it can scarcely be doubted that a judicious mingling of the two will form both the most interesting and the most instructive course for such an Institution as this.

I shall be expected to say a few words upon the services which mathematical science has rendered to the world. And here the difficulty is not to find material, but to select out of the abundance which offers itself.

Little need be said respecting the utility of mathematical science in Surveying, an art which is wholly dependent upon it. In Engineering it is scarcely less indispensable.

To the Physicist and the Chemist it is an instrument of immense power. It is seldom that experiments furnish data pure and simple, for deducing the law which they go to establish. The results, as directly furnished by observation, usually require considerable manipulation in the hands of the mathematician before the law which they establish can be accurately inferred.

In the science of Astronomy, the telescope itself owes all those refinements upon which its great power depends, to mathematical investigations, which have shown the correct form for the speculum in the reflecting telescope, and the combination of lenses necessary for producing achromatism in the refracting telescope; and it is by analytical investigations of the profoundest kind that modern Astronomy is able to predict the motions of the heavenly bodies with that unerring accuracy which is of such inestimable value to the modern navigator.