THE PLACE OF PHYSIOGRAPHY IN THE HIGH-SCHOOL COURSE.

BY EDW. G. HOWE.

Principal of the Preparatory School, University of Illinois.

There is no more profitable query for a teacher, than, in all honesty, to ask, "What is the desirable end of progress?"

Given, a group of children, with certain attainments and environment, what is the ideal for *them*?

This question is worthy of the most careful consideration.

Once clearly discerned (even though in an imperfect manner), and the whole future of school or class will be benefited through distinctness of aim and problems of overcoming existing limitations in material equipment and teaching force will be greatly simplified.

This "progress," to be real, must rest upon a proper sequence of subjects.

Curiosity and the aesthetic sense have begun the child's training long before he enters the school room.

Birds, flowers, pebbles, the sunsets, the moon, leaves and the bright fruits of autumn are among the things which have held his interest, led to much unconscious experimentation and opened up many queries.

Even the child of the city has the parks, markets and shop-windows to interest him; and, in both cases, substantial progress has been made.

"The desirable end" would plainly seem to be the fostering and extending of these interests. To put new tools and methods in his hands, as they become strong enough to use them, and extend his horizon until it includes not only what is, but what has been; the *whole* as well as the parts.

In such comprehensive view, not only will the separate details be recognized, but the all-important knowledge of *their relations to each other* will be added.

Now, the fact is, that less and less has this relation of one thing to another been given due regard.

Knowledge has extended to such a degree that specialization

is becoming a serious peril; the results, in many cases, approaching that of astronomy with the law of gravitation left out.

We are so ardent and earnest in pursuit of the one subject in hand as to be in danger of forgetting that, by no possibility, can we know all about one thing until we have viewed it from all sides and in all its relationships.

That a reaction has already set in against this specializing tendency is witnessed by such signs as the growing use of the word "ecology," the character of the laboratory work outlined in texts and the revival of interest in physical geography (or physiography, as the new name is).

One remedy for this lack of correlation might well be to choose some central subjects ("Man," Pope would say), and *master* it; following out its relationships so thoroughly in all their ramifications as to know much of many things while learning all about one.

How feasible such a plan would be is known to the teacher who has given an enthusiastic class the rein and aided them in their study of side issues.

Few of us, however, are so situated as to follow such a plan to its conclusion, and, for the present at least, we must (confining ourselves now to the sciences) take our physiography, botany, zoölogy, chemistry and physics as separate subjects; each of which would greatly profit by coming after the others and having the advantage of their illumination.

As this cannot be, is there no other way by which these subjects can be more completely correlated and the inspiration gained from a broad and comprehensive view of each as parts of a mighty whole?

Before answering this question, it will be well to consider what has been *omitted* in these five common subjects of our high schools; or, if not wholly omitted, still so briefly touched upon as to need more attention.

Briefly enumerated, these are, the atmosphere and its movements, the ocean and its currents, the distribution of heat and moisture, minerals, rocks, soils, land formation and sculpture, the controlling factors in plant and animal distribution and the relation of all of these to man.

Note in passing that this list includes almost the *entire* inorganic basis for biologic life and activity!

Most of these are topics beyond the successful grasp of children in the grades, and for their apprehension require some knowledge of several of the sciences.

Now, in answer, geology will at once suggest itself as competent to supply this lack; but consideration will show its failure in several important essentials, among which are the subordination of the biological element and almost total absence of the human.

Repeated experience in the past has, however, shown that physiography is well suited for this.

In practice, the various sciences were given about the usual degree of attention; each one being vigorously pushed to a tentative conclusion; and then, to supply omissions, revive and freshen past acquirements and at the same time gain a fresh and inspiring new view of the whole, books like Guyot or Maury were made the basis of broad and thoughtful study.

The results were such as to commend the plan to anyone feeling a similar need.

MOISSAN'S WORK WITH THE ELECTRIC FURNACE.

BY FELIX LENGFELD.

The young student who goes into a chemical library and sees the hundreds of volumes that contain accounts of experiments performed by thousands of chemists living and dead, is apt to feel that nothing more can be done along simple lines, that future work must be upon very complex substances or very rare elements. That same feeling existed a hundred years ago and probably the chemist of the twenty-first century will envy us our virgin field.

In 1800, Crell, translating an article of Proust on copper salts, takes occasion to point out that young chemists should take courage when they see what Proust has done with an old subject, and it behooves every chemist to study carefully Moissan's work to