They 'got the answer in the book' by the common process of firing at it till it was hit, rubbing out and trying again, until the figures were somehow obtained. But so soon as the rule was learned and its application fairly set forth, original examples were given. Notes properly drawn up, with payments endorsed in business form, were given, and the class went to work. For a month they have worked on notes of different forms and at different rates, neither the class nor myself knowing the correct answer until we worked it together. Not only has the class gained immensely in rapidity and accuracy, but they have become so interested that it is a matter of pride with them to do the work rapidly and neatly, and to point out to one another the ingenious expedients for shortening work which are so abundant in all the applications of Percentage.

I trust that this makes clear what I mean by practical arithmetic. It is drawing examples from daily life, applying principles directly to their use, and, above all, avoiding the demoralizing practice of working examples with answers given. It is a bad practice for pupils; it is worse for the teacher. Is there not professional pride enough among teachers to rebuke those publishers who offer 'Keys' for '*Teachers only!*' It makes a little more labor for the teacher, to devise and work original examples, but does not his own mind often need the stimulus of intellectual work?

Y. S. D. *in Illinois Teacher.*

## 3. PRACTICAL MEN.

There is nothing so conclusive in life, as the teachings of experience. No arguments are so powerful to expose a false system as this test. Men who mistake the courage which rises to cope with great physical obstacles, and the brute force of indomitable will for power and training, will be convinced of their errors only by the teachings of experience. As a people, we have a high conceit of our own powers. We have accomplished many wonders, and believe ourselves capable of achieving anything. A writer in a recent public journal, discussing the peculiarities of the American character, speaks thus:

"The ear of the public has been so stuffed with compliments to American enterprise, American self-reliance, and American practical talent, that the public has not yet discovered how incomplete and fragmentary is the practical side of our character. We are swift in all things, but thorough in very few. We are practical, it is true, up to the demands of our most pressing necessities, but beyond that point chaos begins."*

Few words are more thoroughly abused than the word *practical*. In its proper sense, of one skilled in the use or practice of an art or profession, we all accept it as of excellent meaning. But too often it is employed as an apology or cloak for ignorance or arrogant pretension—or is used as a weapon of offence against those whose knowledge it is designed to undervalue by the assertion that it is "theoretical," and not practical. It needs but little experience in the affairs of life to demonstrate the fact, that of all men, the so-called practical man—meaning one who has acquired an art without training or culture—is the greatest theorist, while the truly practical man combines the experience derived from the practice of an art with a competent knowledge of the principles on which it rests. There is a certain indistinctness of ideas and mental confusion on the part of many intelligent persons on this subject, which has its origin in a want of a clear notion of the fundamental difference between *art* and *science*. If we examine the records of invention, we find that art has generally preceded science; that we are indebted to the middle ages for the invention of printing, of paper, glass, gunpowder, the mariner's compass, algebra, and many other things of a like kind. Architecture at the same early period reached a point of beauty which it has never passed; so that a reactionist, reasoning against the claims of modern times to superior science and skill in the arts, might make a plausible argument in favour of the mediæval period. The proper answer to such an argument begins "by distinguishing between art and science in the sense of general, inductive systematic truth. Art is practical, science is speculative: the former is seen in doing; the latter rests in the contemplation of what is known. The art of the builder appears in his edifice, though he may never have meditated on the abstract propositions on which its stability and strength depend. The science of the mathematical mechanician consists in his seeing that under certain conditions bodies must sustain each other's pressure, though he may never have applied his knowledge in a single case." * * * "Art is the parent, not the progeny of science; the realization of principles in practice forms part of the prelude, as well as of the sequel of theoretical discovery. Thus the inventions of the Middle Ages before alluded to, though at the present day they may be portions of our sciences, are no evidences that the sciences then existed, but only that those powers of practical observation and practical skill were at work which prepare the way for theoretical views and scientific discoveries."* If the practice of an art implied as a prior necessity to its skilful use a knowledge of the principles of science involved in it, what mechanician so learned as the juggler who balances on a pole, or the monkey who swings by his tail?

The same distinction obtains between *invention* and *discovery*, which is made between art and science. Many an invention of the greatest importance adds nothing whatever to the sum of human knowledge—does nothing to enlarge the boundary of scientific truth, and yet it may change the whole face of society. The discovery of voltaic electricity and of electro-magnetism preceded by many years the invention of the electro-magnetic telegraph, which involved no single fact or principle new to science, nor one which science had not long before presented to the free use of the inventor. He who devotes himself to enlarging the bounds of human knowledge must rest content too often with the fame which history is sure to award him, while the inventor applies the principles which the investigator has discovered, to enrich the domain of art or benefit mankind. It is the happy lot of modern science, however, often to combine in one these two functions, and the records of science give us illustrious instances of the union of science and art—of discovery and invention in one—of which the safety lamp of Davy and the discoveries of Daguerre and Talbot in sun-painting are in point.—*Address of Prof. B. Silliman, in California Teacher.*

* *Atlantic Monthly*, April, 1867.

## 4. HOW TO INTEREST PRIMARY CLASSES.

1. By cherishing an ardent love for your work and maintaining constantly a deep and lively interest in it. If your heart is not in your instruction, you can not expect your pupils to be. The stream does not rise higher than the fountain, nor will the interest of your pupils in their studies exceed your own.

2. By making such daily preparation as will enable you to come before your classes not only full of the lesson, but with your knowledge of it fresh and ready. Your instruction must come directly from your own brain, hot and ready. It will not do to set "cold victuals" before your little ones. Avoid a slavish use of the text book. Stand before your classes with a free hand and a free eye.

3. By adapting your instruction and requirements to the capacity and wants of your pupils. This will involve a knowledge of the principles which underlie primary instruction, and of the methods which best embody these principles.

4. By so arranging and directing the work of your pupils that each may be kept busy without weariness. This will require a frequent change of activity and employment. The little child's power of attention is very limited. His mental powers as well as his muscles soon tire. He must therefore, change from one kind of exercise to another, and *this change is rest.* The teacher must meet this necessity of the child's nature in her daily programme. Study and slate-exercises, brain-work and hand-work, thinking and doing, must alternate in quick succession. Keep the child's *fingers* interested and busy during each alternate twenty minutes of school hours. Thousands of primary schools are dull and stupid simply because the children have too little to do.—*Ohio Educational Monthly.*

## 5. SABBATH SCHOOL ASSOCIATION OF CANADA.

The Fourth Provincial Sabbath School Convention will (D.V.) be held in the City of Toronto, on Tuesday, Wednesday and Thursday, 8th, 9th and 10th days of October, 1867.

A premium of $50 is offered by the Executive Committee for the best Essay on:—"Sabbath School Conventions—their importance and objects, and the best mode of conducting them." Also another premium of $25 for next most deserving. The Essay to be of the size of an ordinary 16-page tract.

The following subjects are chosen for consideration and discussion during the session of the Convention:—

1. The best mode of training Sunday School Teachers.
2. Previous study and preparation of Teachers.
3. Importance of prompt visitation of absent Scholars by the Teachers.
4. The duty of Parents and Guardians in relation to Sabbath Schools.
5. The best mode of conducting Sabbath Schools, with a view to order and discipline.
6. Sabbath School entertainments—their proper character and limits.
7. The best methods to be adopted to interest children in Missions.
8. Examinations and addresses—their character and importance.
9. Advisableness, or otherwise, of public recitations by Sabbath School scholars.

It is particularly requested that delegates and visitors purposing to attend will give these subjects due consideration, so as to be prepared to speak upon them at the Convention.

* *Whewell*—History of the Inductive Sciences. Vol. I., p. 333.