

tedious, and fatal to good teaching to begin and then to be compelled to leave off through lack of the proper appliances.

11. A well-managed printing-press is supplied with all kinds of type, and is thus equal to every demand that can be made upon it; and, similarly, our class-books must contain everything necessary for a thorough education, that there may be no one who by their aid cannot learn whatever should be learned.

12. The type are not left in confusion, but are neatly arranged in boxes that they may be ready to hand when needed. Similarly, our class-books do not present their subject-matter to the pupil in a confused mass, but split it up into sections, allotting so much to a year, a month, a day, and an hour.

13. Only those type which are needed at the minute are taken from the type-cases; the rest remain undisturbed. Similarly, no books but those intended for his class should be given to a boy; others would only confuse and distract him.

14. Finally, type-setters use a straight edge which helps them to arrange the words in lines, and the lines in columns, and prevents any part from getting out of place. In the same way the instructors of the young should have some standard or model to aid them in their work; that is to say, guide-books should be written for their use, and these should tell them what to do on each occasion, and should preclude the possibility of error.

15. There will, therefore, be two kinds of class-books, those that contain the subject-matter and are intended for the pupils, and guide-books to assist the teacher to handle his subject properly.

16. As we have already remarked, it is the voice of the teacher that corresponds to the ink used in printing. If it be attempted to use type when they are dry, nothing but a faint and evanescent mark is made on the paper, in contrast to the firm and almost indelible impression that results when they have been inked. Similarly, the in-

struction that boys receive from books, those dumb teachers, is obscure and imperfect, but when it is supplemented by the voice of the teacher (who explains everything in a manner suitable to his hearers), it becomes vivid and makes a deep impression on their minds, so that they really understand what they learn and are conscious that they understand it. Again, printing-ink differs from writing-ink, since it is made, not with water, but with oil (indeed, those who want a very superior ink, use the finest oil and the best charcoal); and, similarly, the voice of a teacher who can teach persuasively and clearly should sink like oil into the pupils' minds and carry information with it.

17. Finally, the function of the press in printing is performed in schools by discipline, which is in itself sufficiently powerful to ensure that no pupil shirk his studies. Every sheet of paper that is to form part of a book must pass through the press (hard paper needing more, and soft paper less pressure); and, similarly, whoever wishes to learn at a school must be subjected to its discipline. There are three grades of discipline: firstly, perpetual watchfulness; for since we can never put implicit faith in the diligence or innocence of boys (are they not Adam's brood?) we must keep them continually under our eyes. Secondly, blame, by which those who leave the beaten path must be recalled to the way of reason and obedience. Finally, punishment, which must be employed if exhortation have no effect. All discipline, however, must be used with prudence and with no other object than to induce the pupils to do all their work well.

18. I said that certain processes were necessary, and that these had to be carried out in a certain definite manner. This point deserves a brief investigation.

19. If a certain number of copies of a book is to be printed, that number of sheets is taken at once and printed from the same block, and from each successive block, from the beginning to the end of the book, the same number of sheets, and neither more nor less, is printed; since otherwise some copies of the book would be imperfect. In the

same way, our didactic method lays it down as an essential condition that the whole school be given over at one and the same time to the teaching of one master, that from beginning to end all the scholars be subjected to a graduated course of instruction, and that none be allowed to enter after the session has once begun, or to leave before it is finished. In this way it will be possible for one master to teach a large number of pupils, and for all the pupils to learn every branch of knowledge thoroughly. It will therefore be necessary for all the public schools to open and to close at the same time (it suits our method best if the schools open in autumn rather than in spring), in order that the task allotted to each class may be completed each year, and that all (except those wanting in intellect) may be brought up to a certain standard at the same time, and may enter the next class together. This is an exact analogy of the method used in printing when all the copies of the first page are printed first, then those of the second page, and so on.

20. The better class of books are divided into chapters, columns, and paragraphs, and have spaces on their margins and between their lines. Similarly, our didactic method must have its periods of toil and of rest, with definite spaces of time set apart for honest recreation. The tasks are mapped out for each year, month, day, and hour, and if these divisions are duly observed no class can fail to reach the necessary standard at the end of the session. There are excellent reasons why the hours of public instruction should not exceed four daily, of which two should be before, and two after mid-day. On Saturday the two afternoon hours may be remitted, and the whole of Sunday should be devoted to divine service, so that we have thus twenty-two hours weekly and (making allowance for the holidays) about a thousand hours yearly. How much might be taught and learned in this time, were it only methodically employed!

21. As soon as the type has been set up, the paper is lattened out and laid ready to hand, that nothing may

impede the process of printing. Similarly, a teacher should place his pupils in front of him that he may see them and be seen by all. This we have already shown in chap. xix. Problem 1.

22. The paper is damped and softened, that it may be better fitted to receive the impression of the type. Similarly the pupils in a school must continually be urged to attend, as we have already explained.

23. When this has been done, the type are inked, that a distinct impression may be taken from them. Similarly, the teacher makes the lesson vivid by means of his voice, reading it over and explaining it, that all may understand.

24. The paper is then put into the press, one piece after the other, that the metal type may impress their form on each and every sheet. Similarly, the teacher, after he has explained a construction, and has shown by examples how easily it can be imitated, asks individual pupils to reproduce what he has said, and thus show that they are not merely learners, but actually possessors of knowledge.

25. The printed sheets are then exposed to the wind and are dried. Similarly, in school, the intellects of the pupils are exposed to the bracing influences of repetition, examination, and emulation, until it is certain that the lesson has been thoroughly learned.

26. When they have passed through the press, the printed sheets are all taken and arranged in order, that it may be seen if the copies are complete and without defects, and are therefore fit to be bound, sold, and used. The same function is performed in schools by the examination at the end of the year, when the progress of the pupils, and the thoroughness and comprehensiveness of their training, are investigated by the inspectors; the object being that these latter may certify that the subjects appointed have been properly learned.

27. So far we have confined ourselves to generalities, reserving our detailed investigation for a more suitable occasion. For the present it is sufficient to have shown that our discovery of didachography, or our universal

method, facilitates the multiplication of learned men in precisely the same way that the discovery of printing has facilitated the multiplication of books, those vehicles of learning, and that this is greatly to the advantage of mankind, since "the multitude of the wise is the wisdom of the world" (Wisdom vi. 24). And, since our desire is to increase the sum of Christian wisdom, and to sow the seeds of piety, of learning, and of morality in the hearts of all who are dedicated to God, we may hope for the fulfilment of the divine prophecy: "The earth shall be full of the knowledge of God, as the waters cover the sea" (Isaiah xi. 9).