

up the passages between the islands at the western entrance of Hudson Strait, where it is kept in rapid motion by strong currents. Log-books kept by whalers show that it is frequently found in Hudson Strait in September. We should say that the passage will never be safe, and that large freight-steamers, such as would be required for this trade, cannot be run longer than from the middle of July to the first days of October. It is improbable that under such circumstances a railroad to Fort Churchill and a line to Hudson Bay would pay. The shortness of the season and the dangers of the ice are so great, that this line cannot attain a great commercial value.

#### THINKING IN SHAPE AND PICTORIAL TEACHING.

THE Rev. Edward Thring of Uppingham, the well-known author of 'Theory and Practice of Teaching,' spoke before the teachers' guild in London recently on thinking in shape and pictorial teaching. Mr. Thring began by drawing attention to the vital distinction which divides mankind, consciously or unconsciously, into two classes, — those who value knowledge, and those who value the seeing heart and the seeing eye. The pursuit of knowledge is the creed of the first. Knowledge he defined to be for the multitude second-hand information, which, however valuable, may, like gold in the desert, be utterly useless. He then showed, that, precious or not, few get it, and that the unsuccessful attempt to get it is deadly to living power. Living power is required, and can only be given by teaching pupils to think in shape; that is, to train the mind, whenever it sees any thing, to find out at once what thought made the shape it sees; and, on the other hand, to take every word used and put it at once into some definite shape, example, or reality. Examples of this were given, showing the difference between an arithmetical fact and living feeling, between words and memory and a vivid mental picture. Then the lecturer proceeded to show that every word not vividly understood is a cipher, and that words are not vividly known, and never can be vividly known, unless thinking in shape is taught and practised. After showing the failure of memory-work, the lecturer pointed out that the commonest objects cannot be described correctly, because no one has been taught to see what they really are. A common chair can be made to give a history of thought and life and experience taking shape, and to lead up to the great fact that every shape is such a history, a living narrative, and the whole world a great illuminated volume of thought, speaking through shape which can be read by those who have learned to read thought in shape. But if this is so, then all shape is a language speaking truth or falsehood, giving honor or dishonor. And it does matter whether rooms and appliances are worthy or unworthy. How, then, has England treated lessons? Let the class-rooms in all their meanness answer. Then what class-rooms ought to be was shown, and examples brought forward of pictorial teaching. The way in which walls can be decorated without the painter going near the wall was explained, and designs for wall-decoration given. The treatment of books, and what is needed for books, next claimed attention. Then the effect on language of thinking in shape was dealt with, and the true progress of art by expression ever becoming more vivid in word and painting.

"Thinking in shape and pictorial teaching at once turn all created things into new language for thought. Every created thing becomes, on the spot, a possible new bit of thought, a possible new word born into the world of speech. I throw out, as a suggestion for any master of language, as distinct from a doctorer of words, to examine into the curious fact, that in the last eighty years the English language has in this way doubled itself, by flashing new light into old words, by new combinations of words, by freer use of allusions and metaphors, and by pictorial handling of its material; and that it is practically a new language, in its wonderful increase in power of expression, and the breathing of new life into its shape. For expression goes on forever, as higher life produces higher manifestation of life, feelings, and thought, in human face and form, and again becomes able, by being higher, more sensitive, more sympathizing, not only to see and interpret the new shapes, but to find endless riches of unknown stores of precious discoveries in the old. This is the only true path of progress.

"The pictorial mind first pictures to itself all its own ideas, and

thinks in shape; and, secondly, is ever extracting ideas, new and old, out of the things it sees, picturing to itself all the words it uses, translating and retranslating thought into shape and shape into thought, till all things live and move for it in a universe that is living thought incarnate. The lesson-book is always before it. In city or desert, church or hovel, street or field, with flower, or tree, or cloud, or sun, or animal, or bird, or insect, from end to end of all things, there is the everlasting voice crying, 'He that hath ears to hear let him hear, he that hath eyes to see let him see, for life infinite, language universal, lies at your feet for pleasure and use always.' The pictorial mind is the only power man has that is capable of infinite progress. It is the only power that belongs to all men. It is the only power that is within reach of the poor. It can be taught. It can almost be created.

"As the world goes on and knowledge increases, it will be more and more impossible to know it all, a thing which was once quite within reach. Every man, however learned, will be narrowed by degrees down to a single subject. But subjects are many. There are a thousand languages, for instance; to know how to speak even half a dozen really well is an achievement; and so on, through the whole range of knowledge. How can any one man cope with this accumulation of facts? Boasts of knowledge, therefore, belong to the nursery level, betokening stupendous ignorance of man's capacity for knowing, and of what there is to know. Let us get out of the nursery and betake ourselves to true progress, and men as they are."

But "as long as examinations reign, there can be no true teaching," said Mr. Thring, "and thinking in shape and pictorial teaching find no place."

#### MENTAL SCIENCE.

##### Can the Mind attend to Two Things at Once?

THIS question has been frequently asked, and variously answered, according to the conception of 'attention' and of the objects to be attended to. Those who lay stress on the unity of mind regard it as almost evident *a priori*, that but one concept can occupy the focus of attention at a time, and that, if apparently many are entertained by consciousness at the same moment, it is simply because of the rapidity with which the attention can flit from one to the other. The holders of the opposite view call attention to the fact that in the quickest possible glance, in the flash of an electric spark, we get a view of an object, capable of being analyzed into a series of concepts, and that we saw every one of these as well as any other. A French psychologist, M. Paulhan, has recently stated the problem in its proper aspect, and illustrated the position he takes by some very interesting experiments. What is at one time the sole object of attention, completely filling the field of consciousness, may at another be only a small part of that field. Attention, like the lens of the eye, is now accommodated to act as an instrument of near focus, high magnification, but limited aperture, and again as one of distant focus, small magnifying-power, but wide range. At one time we see the rider and the horse as a single object; at another they are two. Admitting, then, that the object of attention is determined by a subjective element, by interest, by importance, by attractiveness, or what not, it remains to similarly determine the meaning of 'attention.' Just as memory is, from one point of view, not a single faculty, but a co-ordinated set of separate, individual memories, so attention is capable of various degrees of intensity, of various subdivisions of function. There are currents and undercurrents of attention. The eye may be intently engaged in looking for a friend, while the ear is drinking in the notes of a symphony, and we are suddenly conscious of a draught in the room. Whether or not there is a loss of energy between these occupations is to be determined by experiment.

M. Paulhan wrote the lines of one poem while reciting the words of another. The two series would sometimes get confused, a word, syllable, or prominent letter of the recited verse creeping into the written; but such mistakes soon became rare. The two series are largely strung on separate strings, and proceed in parallel directions. To repeat one poem aloud, and mentally go over the words of another, caused greater confusion.

If we compare the sum of the times necessary to perform each act separately with the time necessary to perform the two together,

we arrive at the law that the simpler the operations (especially in widely disparate senses), the more time is gained in performing them simultaneously, there being a loss of time in doing complex acts at the same moment.

To multiply on paper 7,897,654,987,896,687,786 by 7 took M. Paulhan 62 seconds; to recite 25 lines of 12 feet each, 38 seconds; the sum of which is 100 seconds. To do both together required 98 seconds, so that this is about the complexity at which there is neither gain nor loss. Here is a simpler pair of processes: to write out the product of 1,321,242,131,221,241,211 by 2 required but 11 seconds; to recite a certain couplet, 7 seconds; to do both at once, only 12 seconds, — a saving of 6 seconds in 18. The maximum of saving occurs when it takes no longer to do two acts than one; then certainly the two are done at once. This occurred when 421,312,217 was multiplied by 2 while 4 lines of 12 feet each were spoken; each of the processes consuming 6 seconds separately, and no more when performed together.

If the two processes are closely similar, and probably calling into action intimately connected brain-centres, there is a more decided loss. To write out the product of 33,213,442,124,343 by 2 with the left hand while the right does the same for 12,321,443,432,123 by 2, showed a loss of 15 seconds in 38. The right did the multiplication almost twice as rapidly as the left hand.

The following times illustrate the same principle: to write four verses of 'Alholic' required 22 seconds; to recite eleven verses from de Musset required 31 seconds; to do both at once, only 40 seconds.

The sum of the times necessary to read a selection aloud and to mentally repeat another selection was 33 seconds, while to do both simultaneously required as much as 38 seconds.

An attempt was made to have three series of mental operations go on side by side; to have the left hand writing the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, while the right wrote a verse, and the vocal apparatus recited some lines of poetry. This is a very difficult matter: the two hands tended to work intermittently, and there was much evident hesitation, friction, and loss of time.

We see, then, that the brain-centres, though closely co-ordinated, can so thoroughly acquire the habit of doing their more simple functions that it requires but a small portion of the attention to guide their action, while the rest can be given to the activities of another centre. The more unlike in function the other centre, the better can this subdivision take place. But when the act is complex, it soon requires the total amount of attention at command; and to attempt to do any thing else is a loss of energy. That individuals differ largely in their powers to perform such 'double acts' goes almost without saying.

ARTICULATED AND SIGN LANGUAGE. — When we wonder at the rapidity with which deaf-mutes spell out their words on their fingers, we are apt to feel that this invention has really diminished the disadvantages of this class of persons almost to a minimum. That such is not the case is vividly suggested by the statistics which a teacher of the deaf-mute has had the patience to gather. He has counted the average number of words which a pupil in his school wrote or spelled on the fingers per day, and finds it to be 1,118: the teacher similarly employs 216, but uses signs equivalent to 861 words daily. It has been estimated that a mother talks 27,000 words to her child in a day. Making due allowance for the habit of forming only parts of sentences which the deaf-mutes cultivate, and also for the suggestiveness of the sign-language (which hearing people really also use in the form of an expressional accompaniment), the comparative meagreness of the deaf-mute's conversation, and slowness with which his mental food can be brought to him, are plainly evident.

#### BOOK-REVIEWS.

*The Ruling Principle of Method applied to Education.* By ANTONIO ROSMINI SERBATI. Tr. by Mrs. WILLIAM GREY. Boston, Heath. 8°.

OUR English educational literature has had no richer contribution than this translation of Rosmini by Mrs. Grey. It is at once philosophical, scientific, and practical. Rosmini himself is too little

known in this country; and it was our intention, in noticing this book, to give some slight idea of his life and thought in so far as they moulded educational doctrine. But in this we have been anticipated by Mr. H. C. Bowen, late principal of Finsbury Training-College. As Mr. Bowen's sketch is inaccessible to American readers, we feel that we are doing them a service in reproducing most of it. Mr. Bowen calls Rosmini 'the Italian Froebel.'

Antonio Rosmini Serbati was born at Rovereto, in the Italian Tyrol, in 1797. He died at Stresa in 1855. When it is added that he keenly felt and took an active part in the events of his time, these dates above will suffice to show us that his life is worthy of attention, and was not without its trials and exciting episodes.

It was towards the close of 1839 that Rosmini, who had already more than once published the results of his study of psychology, undertook his work on pedagogy. It appears that a pious and generous lady of Stresa, Anna Maria Bolongaro, had offered to intrust to the Institute of the Brethren of Charity (the order founded by Rosmini) the management of an elementary school which her grandfather had founded in that place. The offer was accepted, and Rosmini set to work to compose a complete treatise on pedagogy. 'The Ruling Principle of Method applied to Education' is that part of it which he accomplished, and it carries us very nearly to the end of the kindergarten age. To quote from Francesco Paoli's preface to the original edition, "Rosmini based his treatise directly upon anthropology and psychology, which give us the knowledge of the human faculties which we are to educate, and their modes of action; on idealogy and ethics, which point out the objects, both proximate and ideal, by which the human faculties must be stimulated in order to be properly educated; and on ontology and theology, which provide the knowledge of the ends towards which the human faculties should harmoniously develop, to find in them rest and full satisfaction, which is the ultimate goal of human education." Rosmini divides life, not into periods of years, but into stages or degrees of cognition, — the successive acts of the understanding (*intellezioni*) through which the human mind advances in the development of its powers. The first period extends up to the first smile (roughly, a period of about six weeks), and possesses no definite cognitions, except the primary and fundamental cognition or intuition of being (the innate assurance that something is). It possesses also what Rosmini calls the 'fundamental feeling,' or that generally diffused feeling of our own bodies which, though it is not as yet attended to, constitutes us sentient beings. The cognitions of the second period, which extends up to the first articulate word (roughly, till the end of the first year), consist of the simple perception of things as subsisting, with corresponding volitions, termed by Rosmini 'affective' or 'instinctive,' which have these things for their object. Speech is the sign that the child has entered upon the third period of life, or the second order of cognitions, this order being formed by the child's analyzing the cognitions of the first order, and by his abstracting the more interesting, sensible qualities of things from the ideas of these things in his mind (imaginal ideas); and to these correspond the affective volitions, which have for their object these more interesting qualities abstracted from the actual things, and marked off from the things' other qualities, to which the appetitive faculty is at present indifferent. The third order of cognitions shows itself when the child begins to learn to read, say, at the end of the third year. We have now the exercise of the judging faculty, which has become able to connect by synthesis the elements of the previous analysis, and to affirm the existence in a subject of the qualities before abstracted. The corresponding volitions are the estimative or prizing volitions, by which the mind recognizes in a thing its interesting qualities, and thus estimates them. This is soon followed by the cognitions of the fourth order, which introduce analysis once more, as far as is necessary for forming comparisons between two objects judged of, and giving the preference to one over the other. The volitions belonging to this order are the appreciative, or the volitions of choice. The moral sense, which existed in germ in the preceding periods, now takes a larger development. The cognitions of the fifth order consist in a synthesis by which are determined the relations existing between two things combined into one, and conceived as one, of which conceptions the most important is that of the 'I' and of self-identity. About this