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THE OBSERVATION OF SCHOOL CHILDREN.

By JOHN A. HANCOCK, Fellow in Psychology.

Much of the success of the lawyer comes from his long continued training in working up cases from first hand knowledge in regard to them. He does not go out from the law school to apply in his practice merely a great deal of theory learned from others, but in every case that comes before him he must also investigate the facts and build from the foundation up. And so in every line that might be mentioned the significance of first hand knowledge to its owner, though its scientific value may be very slight, is so great, is so full of meaning, is so stimulating and so productive of power that it seems strange greater use has not been made of it in the past in the training of teachers. Whether in the normal or in the city system there should be carefully organized courses in the observation and testing of the facts of child life. These should cover a period of several years and should include so far as possible the facts and relations of the phases of growth and development of both mind and body.

One point at a time rather than a series of them should be taken up. Little that is new to the scientific world may be discovered, but the drill in observation, the discussion of the results obtained and the later study of some of the standard literature bearing on the point in hand will do much to make the teacher's sympathy for child life intelligent and to increase it.

As some suggestion for the organization of such a course there is presented in this paper the results of a selection from tests that have been tried in this country and abroad. Some of these have been modified where experience has indicated the need for doing so. It is exceedingly difficult to give proper credit for all of them; indeed hardly any one seems to have thought it worth while to do so. Generally they are traceable to the laboratories of Clark University and those workers who have been trained there, to Binet and his co-workers in France and to Kraepelin and his in Germany.

To be used to the best advantage experiments should stand in some clear relation to the work of the teacher. They should bear upon the difficulties which arise in the every day administration of schoolroom work. Following this plan the writer has always succeeded in enlisting interest.

Something of an arbitrary order has been followed in grouping, but the physical tests have been given first, because it was felt that logically this field should first concern teachers. In the preliminary meeting with his class the instructor should raise some of the general questions involved, for example the following: Does the growth of children stand in any relation to their ability to do good school work? Can a child when growing most rapidly do as much and as good work as at other periods? How does the growth of the sexes compare? Which does the better work usually? Compare the dull children with the bright ones physically. Attention should be turned back to the childhood and youth of the members of the class by some questions concerning their own periods of rapid and slow growth. Follow the discussion by explanations of apparatus to be used, by some practice in its use on those present and with methods for recording results. Then assign to each member of the section a half-dozen pupils or more whose measurements are to be taken under the immediate supervision of the instructor before the next meeting of the section, which should come some days later. Some of the general laws of growth can be shown in summing up and studying the results obtained, but it is advisable that each teacher repeat these measurements at regular intervals such as other duties will permit. To the student in the normal class should be assigned the duty of giving the same group such incidental teaching as shall be needed during the first year, *e. g.*, A does not succeed well for some days in a given class, or B enters school late, or C has been absent for some reason or no reason for some time; the student teacher should give the help most needed in some study—help which the regular teacher has not time to give.

The literature of the subject under discussion should not be taken up too soon. It should supplement. Something of a bibliography is given at the conclusion of this paper, but for anything complete the reader is referred to Wilson's Bibliography of Child Study.⁽¹⁾

Similarly one may proceed in other fields after leaving that of physical growth and development.

Records should be kept of the age, sex, grade and nationality of each pupil, and date and time of day when tests were made. Where frequent written tests are made, the pupil should be asked only to write his name. Results should be tabulated with reference to age, sex and nationality. School grades of the same number differ so widely even in the same locality, to say nothing of different localities, that the custom of some good

¹All numbers refer to corresponding references in the bibliography at the end of this article.

workers of tabulating results by grades is to be regretted. What is most needed are the facts of age, sex, nationality, and peculiarities of individual children.

Special care should be taken that pupils should be studied without their knowledge. It is not often necessary that they should know that any unusual use is to be made of their work. More or less unconsciously they warp the real facts when they know that their papers are to be "studied." Give pupils no preliminary drill for any of these tests, unless directed to do so. Omit no part of a test "because the pupils have had no such work." Ability to do many things often develops without the teacher's aid. Poor papers often have as great value to the expert as the better ones, and the absence of the poor ones may lead to wrong conclusions. As far as possible tests should be made a part of some class work. For this the language and grammar classes are particularly suitable.

It is not attempted in this paper to take up tests applicable to children under the ordinary school age. Many of the tests will not be found suitable for children who cannot read and write.

It is suggested that results for each pupil be filed away in a large envelope bearing his name. Considerable of his work should be thus preserved, for extended study covering long periods.

The use of tact at all times in making tests is a most important condition for successful work. Parents are especially sensitive about the defects of their children and about their being known. All such facts when obtained should be respected and discussed only in the most guarded way.

PHYSICAL MEASUREMENTS.

If possible a room should be set aside in which all of the physical tests can be made and some of the others. Usually it will be found better for two persons to work together in this room. Generally it is well to have more than one child present at a time. This will do much to put them quite at their ease.

The number of physical measurements that can be made is almost unlimited already and the list receives additions with the newly published work of every laboratory of psychology, physiology or pedagogy. However, the very great majority of these are neither desirable nor yet feasible for school children. If it is desired, this work may be gone into in as great detail as the Bureau of Education (2) at Washington has done. The following are the anthropometric and psycho-physiologic data gathered there: "Number of pupil; name; date; school grade; name of observer; sex; date of birth; age in years and months;

color of hair, of eyes, of skin; first born, second born, later born; weight; lung capacity; depth of chest; width of chest; height, sitting height; strength of lift, of arms, of right hand grasp, of left hand grasp, total strength; is the subject left-handed? maximum length of head; maximum width of head; cephalic index; distance between zygomatic arches; between external edges of orbits; between corners of eyes; length of nose; width of nose; height of nose; nasal index; length of ears, right, left; length of hands, right, left; width of mouth; thickness of lips; least sensibility to locality, right wrist, left wrist; least sensibility to heat, right wrist, left wrist; least sensibility to contact on the skin by pressure of two points, right temporal muscle, left temporal muscle; least sensibility to smell, right nostril, left nostril; least sensibility of muscle to sense of weight, right hand, left hand; pulse; respiration."

While it is very probable that all such tests will some day be made generally, yet it does not now seem advisable for beginners. For the teacher it is worth while to advise measurements of height, both standing and sitting, weight, and such tests of the senses, of fatigue and of motor ability as will enable her to tell when children are incapacitated in any way from the performance of any of their school duties. The abnormal in any of these lines is so likely to produce dullness mentally that the teacher must be watchful concerning them.

All memoranda should show the time of day and weather conditions under which the tests were taken. Fatigue and weight vary a good deal, especially with the time of day and weather. So far as possible the repetition of tests should be made under the same conditions.

Beginning, then, with height measurements, the directions given by Boas, (4) the leading anthropometrist of the country, should be followed: "Height standing: Let the person stand close to the wall in front of the measuring rod. His heels must be close together, touching the wall and he must stand perfectly straight, looking straight ahead without raising or dropping the chin, the head touching the wall. Read off the height of the crown of the head by means of the triangle, pressing one side against the rod, the other against the crown of the head."

"Height sitting: Put a low level seat (for instance a small wooden box) in front of the measuring rod. Let the person sit on it so that his knees are about five inches higher than the seat, which is accomplished by making the seat sufficiently low, or by using a footstool. Let the person sit far back close to the wall, keeping his back erect against the wall. He must look straight ahead without raising or dropping the chin, the head touching the wall. Give the height of the seat and of the crown of the head."

"The weight is to be taken in ordinary indoor costume."

Fairbanks bathroom scales, which have been carefully tested, are recommended. A carefully graded measuring rod fixed to the side of the room should be used if the portable set of instruments of the Bertillon system are not available. From the height deduct the thickness of the shoe heels. This may be ascertained with a pair of calipers. Get a number of the children to make up at home a complete suit of clothing including shoes, in a bundle, and bring the bundle to school, where it should be weighed. Deduct this weight from the weight already taken. Try to establish something of a ratio between the total weight and the weight of the clothing.

Among the interesting studies which may be made at this stage is the following: Study all of the children of a given age, for example the twelve-year-olds. How many of each are there in the different grades? Compare the height and weight of those in each grade. Does there seem to be any positive fact standing out? Where are the well fed, well nourished, the sickly, the stupid, the overgrown, the best developed physically? How about the school work of each? Do children lose in weight from confinement in the schoolroom?

Broca's calipers or those used in the Bertillon system may be used in taking the principal face measurements. The greatest length and width of the head should be taken on a level with the root of the nose, and in measuring the projections of the face the cephalometric square should be used. The angles are taken with Topinard's goniometer.

The degree of least susceptibility to pain can be studied and approximate results obtained by using McDonald's temple algometer, or Cattell's hand algometer. The instrument is applied to temple or hand, and as soon as the pressure becomes in the least degree disagreeable the degree of pressure is read off from the scale by the operator.

Something of the relative development of the sense of touch may be determined by the use of the æsthesiometer. The subject, with eyes closed, is asked to distinguish when he is touched with one point or two. The distance at which the two points of the instrument are thought to be one is noted.

The threshold of just perceptible touch is determined easily by Scripture's set of touch weights.

The effect of sight on the judgment of weights is studied with a series of weights of exactly the same weight but differing in bulk. Children are asked to arrange the weights in the order of their weight.

No investigator abroad is more fruitful in devices for studying children than Binet. His "*L'Année Psychologique*" (6) is

a storehouse of them. He studied control and strength of the large muscles, by noting the ability to climb a rope of a thickness suitable for the hands of children. Results were tabulated according to the distance climbed, using hands alone, and also the distance using both hands and feet.

He also tested for quickness with large muscles by having each child of the school run, in the presence of its mates, over a twenty or thirty yard course.

A great many tests have been made for vital capacity using the spirometer. Its value has been severely criticised and it may be ultimately rejected. Binet, fearing it on hygienic grounds made use of a new device to get some idea of the vital capacity of the school children. He measured this by the distance at which they could blow out a wax taper. At what maximal distance could this be done? On a table a scale of distance was marked, and an upright bar placed at the height of the pupil's chin, so that he could not lean beyond this. He was then given a number of trials till his maximal distance was shown. In connection with any lung power test take the measurement of the lungs with a tape line. Measure first with the breath expired as fully as possible and then with the lungs filled. Measure just under the arm.

The chronoscope is used for measuring reaction time. Generally it will be necessary to get as inexpensive a one as possible. Of the less expensive the Vernier is perhaps the most satisfactory. Scripture's is also very good. The question with this is how quickly can a child react in response to a given signal either of sound, sight, or touch. A somewhat complicated device is necessary if reaction and choice are to be tested at the same time.

The dynamometer is used in measuring the strength of grip. Smedley's, (7) which is adjustable to the hands of children, is preferable. Scripture's and Binet's each give some measure of the strength of the great muscles of the body. Several trials should be given always. The hands may alternate with the hand dynamometer. Record all of the results, not only for getting the maximum grip, but also for the number of efforts necessary to do the best. The larger instrument is also adjustable to the height of the pupil. These tests like many other of the physical tests are also used in fatigue studies.

FATIGUE.

Among the many factors that must be considered in the successful organization of school work is that of children's susceptibility to over-fatigue. There is a degree of fatigue that is normal and unobjectionable. One tires from his day's work, but he knows that he will be quite able to resume work on the

morrow and that he will doubtless sleep better and have a better appetite for having been fatigued. The abnormal phase cannot be passed over so lightly. It appears when work has been too long continued for some time, varying with the individual. The night's rest leaves one feeling more fatigued than on the evening before. It takes some time to throw this off. There may be sudden muscular movements without the person being able to prevent them, twitchings of hands and face or eyes, lack of ordinary color in the face, shaky writing, inaccuracy of ordinarily well done work, irritability of temper, dullness in the recitations, poor memory for the time being, dulling of the senses, sleeplessness and nervousness. The degree of over-fatigue is shown to a great extent by the number of these symptoms present.

It is possible for each to work out a certain order of duties and rest periods in order to get the greatest amount of work done for each day. This will be found to vary to some extent with the season and weather as well as health.

In studying the order and amount of work which should be exacted of each child the problem is further complicated by the fact that growth and development have not ceased with them and that they are also irregular. Among the general questions to be considered are:—How does susceptibility to fatigue vary with the season and weather? There is generally a year in the early teens when both sexes fatigue more readily than in the years immediately before and after. What allowances should be made for this? Was there such a period in the life of the students? Do children when growing rapidly suffer more from fatigue than at other times or less? Do boys or girls fatigue the more readily? To what extent ought rapidly growing children to be chided for laziness?

General observation and practice have done something in determining the order of the school programme with reference to fatigue, but the programme is by no means scientific. Thoughtful study will do much more. What can you say about the following problems?

To what extent should the same programme be followed daily? What is the best time of day for each class? What should be the order and frequency of the recesses or of the "physical training?" How long can a class be held on the same subject to advantage? How does interest in a subject affect the readiness with which fatigue appears?

But there is a factor quite likely to appear in a study of fatigue in the pupils that may wholly change results in unexpected ways: The teacher—her health, nervous condition, amount of sleep she has had the night before, whether she exhausted herself by working too late or by having "too good a time" or not.

The work of Dr. Hodge on the changes in nerve cells due to fatigue led to a great deal of study of fatigue, and Galton shortly after gave these four tests for detecting it in its incipient state:—The length of time during which neatness of execution can be sustained in performing a prolonged task; promptness and sureness of memory in simple things; common sense arithmetical problems; and reaction time.

One class of investigators, following the lead of the Russian alienist Sikorsky, have made their tests center around dictation exercises, and this indeed has many advantages. No special apparatus is necessary. Dictation work is so common that the effect of practice would be too slight to affect the results. Dictation of work in different branches of study may also be given. Further, it is easy to sum up results.

Using this method the following is suggested, and others can doubtless be devised: Have the pupils copy from dictation just before and after each recitation during the day. For each dictation select a half-dozen sentences, each of which shall be from one of the school text books and shall have twenty-five syllables in it,—at least the same number of syllables. The percentage of error as it varies during the day, how affected by recesses as well as recitations, and the length of time taken for each dictation will be among the points of interest worth studying. Should "physical training" be a part of the daily programme? Compare results before and after with those before and after a recess during which the children have engaged in moderate plays and games. Study the phrases, words and letters with reference to any omission of each, change of place of word or letter, insertion of word or letter not dictated, substitution of word or letter not dictated, or of one for another, and finally the doubling of a letter or not doubling it as was right. This study may be abbreviated by making but two or three tests during the day, or it may be varied by making the test once or twice a day during a week at the same period each time.

Another group of investigators have experimented with the addition, subtraction and multiplication of simple numbers. These have arranged their work very much according to the plan suggested by Kraepelin in an article translated for the *Pop. Sci. Mo.* Vol. XLIX. Although he is speaking particularly of mental ability, what he says applies to the testing of fatigue. Adults are evidently in mind and the test needs to be abbreviated to ten, fifteen or twenty minutes work for children, according to grade. He says:—"The measure is afforded by determining the number of small, similar problems resolved by the subject in a given time—such, for example, as numbering letters, reading, the learning by heart of a series of numbers or syllables,

and the continuous addition of columns of numbers. In the last mentioned the person under trial is set to adding figures ranged under one another, in a book printed expressly for that purpose, for a considerable time, without stopping under some circumstances for several hours. When the sum reaches a hundred, the hundred is simply carried on and added to the excess in units. A bell sounds every five minutes, when the candidate draws a line after the last added number. At the end of the trial it is easy to determine how many numbers the person can add every five minutes."

It is not to be expected that one will make more errors the longer he works. For a time at least the number of errors may show a decrease. Effectiveness increases for a time generally as one warms up for the work in hand. Spurts of ability are to be expected as well as intervals of fatigue greater than others.

This test has also been tried frequently:—Having all of the pupils start at a given signal let them make as many figures of a given kind, *e. g.*, 6's, during a period of two minutes. Compare the number made at different times during the day.

Similarly have a series of pages in their readers in mind and let them count the letters in the first ten lines on any one given page, sending them to a different page each time.

Have results handed in each time with the name of the pupil written on the slip of paper.

In the arithmetic work note carefully the effect of practice on the amount of work that can be done in a given time. This amount ought to show interesting changes during the year, particularly during the winter and spring months.

The ergograph has been the instrument used by yet another group of students: led by Mosso. (8) (9) Where apparatus is available it is very desirable to have this instrument. A two-minute test with this at set intervals during the day will show interesting variations of power. The curve for each individual will be tolerably constant but will show modifications due to health and fatigue.

Similarly the dynamometer may be used in fatigue studies as well as the tremograph, æsthesiometer and chronoscope. Griesbach with the æsthesiometer tested the sensibility of the forehead, cheek, ball of thumb, end of the index finger, tip of the nose and the underlip. The value of this test is seriously disputed by Leuba and Bolton. It is to be expected that considerable variation in sensibility to touch, steadiness of control, degree of strength, and reaction time will appear with season, health and fatigue.

Binet and Henri report other tests principally important in showing a number of changes which accompany mental activity,

but which may also be used to test for fatigue; the rapidity of the heart beat, the capillary circulation, the blood pressure, the temperature of the body, the number and shape of the respiratory beats, automatic muscular action and changes in nutrition. These cannot well be made in the schoolroom, though some of them the teacher can note in her own case.

Nervousness and Chorea. (11) Tendencies toward nervousness and chorea are very common among American children. One should early learn to use these and keep close watch for them in those children who are in the kindergarten and in children who are taking instrumental music lessons. Repeat these tests at intervals of six or eight weeks on these children.

Sense Tests. Mental brightness or dullness is closely associated with physical conditions. Sense defects show themselves in some mental deficiency, and the defect remedied the mental condition at once responds. It is very important to know what pupils have any sense defect of consequence and to make due allowance for it. It is not expected that the teacher shall have the skill of the physician, but that she shall be able to tell whether or no any serious defects exist and something of its nature. It is not well to make close enquiries of pupils concerning symptoms. Suggesting symptoms is a sure way to get them among children in great frequency.

The Eyes. One easily sees those children whose eyes show some inflammation or suppuration of the lids, those with the strained look characteristic of weak eyes, and those who hold the book too near the eyes when studying. Those with the suppurated eyes should be sent home for treatment. There is likely to be contagion in the condition.

Have a test in copying work from the board. Write for the children on the board a few sentences in a hand large enough for them to read easily. Have the sentences copied. Note the papers. Are there any serious mistakes? Make a list of those children who have failed seriously. Of course children who cannot read and write cannot be included in this test. Add to the list any who are particularly inattentive in work. Visit the homes of these children and learn all that is available concerning the peculiarities of the children. Give or send to each parent or guardian a copy of the following general letter. It is adapted from those used by Principals Atkinson and Scudder.

Locality,Date,
To M..... :
Dear:

We shall be glad to confer with you from time to time and to receive from you any information in regard to your.....

especially of his interests out of school, that you may be willing to give us. Your replies will be treated as confidential if you so desire. The information will be used by the school authorities only, and is asked for in order that we may be able to do our best possible for the children under our care.

You will greatly oblige if you will fill out and return this blank within a week.

Name of pupil, _____ Date of birth, _____
 Condition of health during the past year or two, _____
 Tendency to or frequency of headaches, _____
 Is eyesight, hearing or throat defective in any way of which you know?

How many hours sleep does _____ have?

Does _____ take time enough to eat a good breakfast and dinner each day before coming to school?

About how much time is spent each day in recreation and exercise?

Mention any injurious effects that seem to you to be traceable to school influences or requirements.

On returning from school is there any headache, nervousness, fretfulness or low spirits?

Does this appear more marked at the end of the week? (If so, and it becomes more noticeable by the end of the month, we hope that you will inform us of it.)

We regard care of the health and the development of a strong physique, especially with girls, as far more important than study. Considerations of health, therefore, should always come first; but health, permitting of good hard study, is one of the cardinal virtues of school life. This involves the problem of diet, regular hours of sleep, a minimum of excitement—parties, etc.,—plenty of recreation and a reasonable share for both boys and girls in the duties of the home, and some regular home study after the sixth grade is reached.

Your cordial co-operation in the work of the school is solicited.

Yours very truly, ——— ———.

Parents easily overlook defects seen every day. Study your returns carefully for any children that appear to you to have serious defects not mentioned in the filled out blanks. It is possible for the teacher to determine some sense defects not reported unless the children have been examined by oculist or aurist.

Get Snellen's (12) test types or Queen's. The use of either or both of these is advisable. Both should give the same results, and it will be well to check against possible error while learning to use them by using both with a number of children at the same sitting. It must particularly be borne in mind that the

cards should be kept out of sight when not in use. Children quickly commit the lists of letters and give them whether they see them or not. For special use with illiterates, and with children too young to read, use one of the Snellen cards on which the letters are all E's but so placed that the letters face in different directions. The test consists in being able to tell in what direction the letter opens. Whatever card is used it should be hung in a clear light.

The following is Dr. Allport's (13) blank used in his tests made in the Minneapolis schools. It is worth following.

" Public Schools.
 Date, School,
 Principal Examiner

INSTRUCTIONS FOR EYE EXAMINATIONS.

The examination should be made privately and singly, in a room apart from the general school session.

Ascertain whether the pupil habitually suffers from inflamed lids or eyes. Children already wearing glasses should be tested with such glasses properly adjusted on the face.

Place a card of Snellen's Test-Types on the wall in good light; do not allow the face of the card to be covered by glass.

The line marked XX (20) should be seen at 20 feet, therefore place the pupil at 20 feet from the card.

Each eye should be examined separately.

Hold a card over one eye while the other is being examined. Do not press upon the covered eye, as the pressure might induce an incorrect examination. Have the pupil begin at the top of the test card, and read aloud down as far as he can, first with one eye and then with the other.

If the pupil does not habitually suffer from inflamed lids or eyes, and can read a *majority* of the XX (20) test type with *each* eye and does not, upon inquiry, complain of *habitually* tired and painful eyes or headache after study, his eyes may be considered satisfactory; but if he habitually suffers from inflamed lids or eyes, or cannot read a *majority* of the XX (20) types with each eye, or habitually complains of tired and painful eyes or headache after study, a card of information should be sent to the parent or guardian.

Please examine your entire school by this method, but only such pupils as are thought necessary to send to an oculist need tabulation in this blank. May the first, of each year, please complete this report and send it to the superintendent of schools, and a duplicate to the board oculist. This will afford you an opportunity to examine your pupils, to note whether they follow your suggestion with regard to consulting an oculist, and if so, to observe the effect upon the pupil's conduct, health, ap-

plication to study, etc., which you will please carefully but briefly note in the proper place in this sheet.

First grade children need not be examined.

Number—Name—Sex—Age of pupil.

Does the pupil habitually suffer from inflamed lids or eyes?

State the number of last line seen by pupil with right eye.
Same for left eye.

Do the eyes and head habitually grow weary and painful after study?

Did pupil consult an oculist and follow advice?

Describe briefly the results of the treatment."

Astigmatism, where it is at all abnormal, is a frequent cause of headaches. Snellen has a card for testing this. Follow the directions already given as to distance (twenty feet from the card), and test one eye at a time. It is especially necessary in this to avoid the suggestive question. Remember that there is a normal astigmatism.

Ask the pupil to begin with any line on the card, follow the lines around and describe their color to you. Ask him next to tell how distinct the lines are. A slight change in color—apparently to brown—is of no consequence, but if this is very marked and the lines in places seem to be blurred it is a case to be referred to the oculist. To attempt school work with eyes seriously astigmatic means much suffering to the pupil and work much delayed, with often the charge of stupidity against him.

Queen's card has certain advantages and has full directions printed on its back for its use.

There is another defect sometimes found which is a defect in the muscles moving the eyeball. There is difficulty in focussing both eyes on the same point. Pupils so troubled do especially poor work in reading. They are likely to insert a word not in the text or to omit some of the words. While one eye is on the line in question, the other, which is more or less disregarded, brings occasionally into the field of consciousness words from some other part of the page. This may also show itself in a confusing of the order of the letters in trying to spell a word from the printed or written page. Such cases need medical attention. Extreme nervousness is pretty certain to be present also.

Color Blindness. This is not so serious a defect as are the others mentioned, but a knowledge of its presence may save embarrassment and account for certain failures in map work and in art work. For its exact study Hering's apparatus is recommended by Titchener. For general school purposes the Holmgren wools are satisfactory. These are skeins of different colors, first, three standard test colors—light green, pale purple,

and bright red; then other skeins of different shades. Scripture's (14) directions for this test are as follows: "The light green skein is laid before the person tested and he is told to pick out of the heap all colors that are like it. Nothing more is to be said; names of colors must not be used. If he picks out grays, brownish grays, yellows, orange, or faint pink, as the same, he is color blind. Now the purple skein is laid before him. If he picks out blue or violet as the same he is red blind; if he selects only gray or green he is green blind. As a clincher the red skein is used. A red blind person will match this with dark greens or dark browns, while the green blind person will choose light greens or light browns."

For the study of color sensitiveness the Maxwell color-top is good. By means of this the exact percentage of another color necessary before its presence can be told can be determined. One adjusts with whatever shades are to be tried.

Hearing. (16) Defects of this sense are very common. Many children conceal them by shrewd guessing and carefully watching the person speaking. Those pupils in need of some exact test may be sifted out by some trial tests. It is always safe to place in this list the inattentive and dull. Ask the pupils to take pencil and paper and write what is dictated to them. Make no explanation of your reason. Select a paragraph from one of their text-books. Stand behind them and read in an ordinary tone of voice such as you use at other times. Read for five or even ten minutes. Gather the papers and note those who have made mistakes in any great number. Later in the day or during the immediately following days step behind these placed on the list and make some request in an ordinary tone of voice taking care to speak the name of the pupil last. In this way it is possible to select those who are depending a great deal on the eye to help them in determining what is said to them.

There is such a thing as being able to hear only certain sounds well, and of being able to hear only by straining the ear constantly. Again, hearing may be somewhat intermittent. Such difficulties account in part for the difficulties which some have in learning to spell.

It is well to test for what is called sound-blindness. A distinguished Boston aurist gives the following list of words for making this test:—fan, log, long, pen, dog, pod, land, few, cat. Give each pupil a slip of paper. Stand in the back part of the room and pronounce these words; pronounce each but once. Using this list Miss Wiltse selected eighty-four pupils in an eastern school as being tone-deaf. The aurist then tested them with more exact means and found that the word test had failed on but four.

There are tests which may be made in determining the distance at which the whisper, or a watch, or a tuning-fork may be heard. They are offered by good authorities, but these tests, except perhaps the whisper, do not seem free from sources of serious error. The tests already mentioned are sufficient to tell the teacher who her defective pupils are, and something of the nature of their defects, and this is all that is necessary for her to know. If more exact results are desired Seashore's audiometer (17) should be obtained. The audiometer especially useful in determining the possibility of giving the child a training in music. The claim so often made that any child can sing if it will but try is not founded on fact, as Seashore's work so clearly shows.

The Throat and Nose. Closely allied to ear troubles are disorders of throat and nose.(18) Here, again, it is the stupid, the dull, and the inattentive that should be in mind. "Adenoid growths" often clog the nasal passages, making it more or less difficult to breath through them. Nervousness, dullness and headaches result. The tonsils may be diseased or enlarged. Select pupils who breath through the mouth habitually. Take opportunities when they can be spoken to alone. Ask them to close first one nostril and then another. If they cannot breath through the nose readily advise them to consult their physician.

Motor Tests. In the study of the motor ability of children Bryan's classic work is still easily the leader. This, like others of the same class, was undertaken for the purpose to get something of a scientific basis for the school room work involving the muscles,—drawing, writing, manual training, kindergarten employments, etc. Bryan(18) studied the normal rates of movement of all of the joints of the upper extremities by means of a telegraph key with a clockwork registering apparatus attached. He tested the precision of movement in children by means of apparatus which he describes as follows: "Strips of platinum foil were pasted smoothly on plate glass so as to make an angle of $2\frac{1}{2}$ degrees. A small steel needle set in a common wooden penholder, served as stylus. Three to four La Clanche cells constituted the battery. A telegraph sounder gave the signal when the needle touched the platinum." Each child witnessed others working before his turn came. Seated before the apparatus he was given six trials with each hand in the effort to move the pen as far up the angle as possible without touching either side. Bryan further tested precision by asking them to try when seated at the table to put a pen in a hole a millimeter square, the arm being held about a foot above the hole.

Another test for accuracy is that reported by Bagley.(19) It

is a variation of the old game with bean bags. "A recording target was mounted upon a table, the target being inclined backward to make an angle of 45 degrees with the table top. The target consisted of a wooden frame with a solid back, the frame being fastened to the back by means of hinges. Into this frame a sheet of paper was inserted having marked upon its center a black bull's eye 10 mm. in diameter. Behind this was a sheet of carbon paper and a sheet of record paper upon which the impressions were preserved. The subject was placed two meters away, facing the target, and was prevented from moving nearer by a movable upright. He was given 10 marbles and directed to toss them one at a time, attempting to strike the bull's eye at each trial."

Among other tests of this kind worth trying may be mentioned the following: Test accuracy of touch by placing before children a card on which are arranged rows of dots, the dots in the same row standing at equal distances but the distances varying with the rows. In this a pen may be used, but the arm should be held free above the table.

Arrange series of points, some three, some four, and so on up to even six or seven inches distance apart. Test the ability of the children, holding the arm free from the table, to connect these points.

Rapidity of movement may also be tested by the use of the device already mentioned,—all trying during two minutes to see how many 6's they can make.

In studying results compare the ability of the bright pupils with the duller, and the boys with the girls,—children of one age with those of another. Does there seem to be any period when ability to do exact work increases more rapidly than at others? Do there seem to be any periods when power is lost? Note these points also with succeeding tests.

Some years ago I became interested in the adaptation of the work of the kindergarten to the the motor ability(11) of young children, and gathered and used in Worcester a number of tests. Among them were the following: Ask the child to stand with his feet close together and hands at sides. Is there any swaying of the body? Try the same with the eyes closed. Is there any difference? Have him walk across the room backwards with eyes closed. (Keep near him to prevent falling.) Is there any dragging of either foot, walking with the feet apart, or turning to right or left? Have him try to sit still a half a minute exactly. Note all of the efforts that he makes in doing this. Does he hold his breath? It was thought that these three would show in some degree some facts concerning the relatively incomplete control of muscles which children have. The fourth test was Warner's (11) test for nervousness. It is

as follows: Ask the child when you have him alone to close his eyes and hold out his hands horizontally with palm of hand vertical, with fingers spread. (Show him how.) Is there tremor or twitching of the fingers? Which ones, and in what directions? Is it slight or distinct? The following is Sturgis's test for chorea—St. Vitus Dance: "The hand test is infallible and may be thus applied: Bid the child to hold up both hands open, with extended arms, the palms toward you. If that is done steadily, both hands upright, and both alike, no finger or hand quivering, no falling back of either hand, nothing to choose between the positions of the two, then the child has not, nor is it near (either before or after) St. Vitus dance. You may confirm this test by another. Let the child place the open hands upon yours palm to palm. Look then at the back of the child's hands, observe whether fingers or thumbs (especially the latter) repose without tremor and without restraint."

For some study of ability to use the finer muscles exactly the following questions were asked, and many of the tests tried: Does the child dress himself? Button clothing, and fasten hooks and eyes? Can he tie the ends of a string together? In what kind of a knot? Can he thread a needle? How small a one? In which hand does he hold it? Can he interlace slats of paste board? Try him with four and with six. If he does not succeed show him how once, and then see if he can succeed. Can he wind thread on a spool? How does he do it? Can he spin a top made of half a spool or of a button mold? Can he snap a marble? Can he hop on either foot? Stand on tip-toes or heels? Can he hop on each foot? Make some simple pattern of blocks composed of eight square blocks. Can he imitate the pattern? Count and beat time, double, treble, quadruple. Can he do it? Rapidly? Can he march, keeping step as you count time or play for him? Can he run and keep time? Does he when marching, move head, mouth, eyes or tongue? Pat the top of your head and at the same time move the other in a circle on your breast. Can he imitate you? Rest your forearms on the table, the hands in an easy position with the fingers curved, and the lower parts of the palms and the tips of the fingers touching the surface of the table. Begin tapping, letting the movement proceed rapidly from the little fingers to the thumbs. Ask him to imitate you. Notice the movements that he actually makes. Are they with the hand and arm moving together from the elbow; the whole hand moving from the wrist; all the fingers moving in unison from the knuckles; or with index finger alternating with the other three? Reverse the tapping beginning with the thumbs. Can he imitate you any better? Just what does he do? Can he drive a nail or hit it squarely after several trials

when started for him? Can he roll a hoop? Skate? Turn a summersault or walk on his hands? (The boy of course.) What movements seem to you to be the most difficult to learn?

The control of the large muscles may be studied to advantage by the use of Bullard's and Brackett's ataxiagraph. (20) By means of this the involuntary movements made in the effort to stand perfectly still are charted. Jastrow's automato-graph I have made a good deal of use of in studying the control of the large muscles of the arm. Results with this are similarly charted on smoked paper. For the study of the exact control of the finer muscles of the fingers I have used Bullard and Brackett's ataxiagraph. Binet and Delabarre have both devised excellent ataxiagraphs. In these studies compare the power of children with that of adults. Does there seem to be any law of the order of development of control?

The Plays and Games of Children. (21) This is a field which has been allowed to grow up with very little care from the teacher. The play ground should concern her as much as the recitation. It affords opportunities that are unlimited for moulding character. It is wise to be a careful student of plays and games and to have at hand some of the better literature of the subject.

There is not in this country that settled condition which has led to something like the established order of plays found in other lands. There are, however, strong tendencies toward this. Something of this may be noted by keeping memoranda during some months of the plays the children themselves start. When some such data have been secured study it with reference to the character of the plays. There is some special element in each, some preference due to season, weather, disposition, or sex. One should recall his own childhood favorites and that of friends.

For a language lesson or "composition" lesson the children may be asked to write all of the plays and games they know, stating those they like and why, as well as those they dislike and why, and what time of year they think each should be played.

For another exercise they may write their answers to this list of questions: What games have you or your friends invented? Describe each. How long did you play them before giving them up? To what extent did other children imitate you? What do you play, and how do you amuse yourself when you are alone? When you have one, two or more playmates? What do you do for evening amusements? What games do you think suitable for Sundays? What else do you do to amuse yourself? What playthings have you made? What toys do you like best? What ones have you quit playing with?

Even boys like dolls, though they would feel disgraced to own it. Their liking for them is pronounced at some period, and later it changes over to some other form like brownies. See what can be done with this. "You may write all you can about dolls. Tell why boys dislike them. Did you ever know boys to play with them? Or with brownies? How old were these boys? What kinds of dolls do you know children to have? Do they ever play that they are sick? What diseases do they play that they have? What medicines do they play that they give them? How do they manage to get some one to play doctor for them? Do they ever play funerals with them? How do they play it? Do they ever play doll parties? Tell how it is played. What is done with dolls at night? What kinds of dolls are liked best?"

Most children have at some time made some collection, stamps, buttons, cigar tags, etc. For a language exercise ask them to answer the following: What is your collection? How large is it? When did you begin it? How long have you had it? Where do you keep it? What are you going to do with it? What made you think of making it? Why do you like it? Did you ever have any others? What became of them? Which was your favorite? Why?

MENTAL ABILITY.

It is worth trying to test as exactly as possible this power in different lines. The teacher is interested in knowing how rapidly any given kind of work can be done to advantage by each child, what his rate of improvement is, his power of retention, his susceptibility to fatigue and capacity for recuperation, how long after beginning a given piece of work before he can be doing his best, his tendency to work best by spurts, the degree to which he can concentrate attention, and the peculiarities of his memory. Individual psychology is largely the field here, and there is now a marked pushing in that direction. All of these factors just mentioned are important in determining mental efficiency. No one test is exclusively mental, hence the great difficulty in attempting an exact classification.

What is the range of children's knowledge at the time when they enter school? What can they do? The significance of this problem was grasped by a German investigator who published in 1869 the results of an investigation on this subject. Shortly afterwards President Hall (22) elaborated a series of questions which were given to Boston children. These questions bore on what children had seen of animal life in its normal environment, what they had seen of both country and city life, where all they had been, what all they could do, what stories they knew from the Bible and other sources, what phe-

nomena of the heavens they had noticed, with what of plant life they were familiar, what knowledge they had of their own anatomy, what geographical, arithmetical, and geometrical concepts they had, of what trades they had some notions, of what sources of food supply they had some idea, what time relations they knew, and what knowledge of minerals they had. This study has been repeated with a good deal of profit. All of these points could be taken up in primary language classes and discussed with the children, one point often sufficing for a single recitation. It is suggested that early language training should *not* include written work.

Get clearly in mind what is meant by eye-mindedness, ear-mindedness and motor-mindedness. (23) Try the following on some acquaintances out of school, and note the difference in mental habits shown by the results. The list is one published by Columbia University, and is evidently largely borrowed from Galton. "Think of your breakfast table as you sat down to it this morning; call up the appearance of the table, the dishes and the food on it, the persons present, etc. Then write answers to the following questions: Are the outlines of the objects distinct and sharp? Are the colors bright and natural? Where does the image seem to be situated? In the head? Before the eyes? At a distance? How does the size of the image compare with the actual size of the scene? Can you call to mind better the face or the voice of a friend? When "violin" is suggested, do you first think of the appearance of the instrument, or the sounds made when it is played? Can you call to mind natural scenery so that it gives you pleasure? Music? The taste of fruit? Have you ever apparently heard a voice or seen a figure when none was present? To these could be added such questions as, How do you remember music best? By "ear?" By the appearance of the printed score? Or by the rhythm of it? How do you proceed to commit anything to memory? Do you easily remember quotations, dates, and isolated facts?

Children as well as adults use different methods. To one the appeal must be made through the eye, to another through the ear, another must have a carefully arranged logical explanation, another must go through the development of the whole argument, writing it out. A knowledge of the peculiarities of each will be of service in every class in the school. The following test was arranged by Kirkpatrick, who evidently adapted it from Binet. Take thirty names of common objects and arrange in three lists as follows, care being taken not to group together words commonly associated: I. box, desk, thumb, chair, cap, broom, sock, bird, axe, post; II. door, stool, slate, rug, hinge, corn, peach, shoe, hat, watch; III. pen,

spoon, pencil, knife, shears, spool, bottle, thimble, spectacles, book. Make the test beginning with the third primary grade. Pronounce the words in the first column at the rate of one every two seconds. Having already placed on the board and covered the second list, now uncover one every two seconds, erasing it after the pupils have had a chance to look at it during that time. Instead of the words in the third list show the object itself at the rate of one every two seconds. At the close of each list ask the pupils to write as many of the words as they can remember. Three days later ask them to write as many of each list as they can recall. I think a fourth list might be added which should be read to the pupils, and which they should pronounce and also write. This list could be of objects for one test which they could also see. It will be of interest to note the facility with which a list of this kind will be remembered as compared with any of the foregoing. Kirkpatrick also offers this: Give orally the following lists of words asking the pupils to think of the sound represented by each of the words in the first, of the visual appearance suggested by the words in the second, and of the objects named in the third: I. loud, bang, whisper, boom, splash, hiss, buzz, whiz, tinkle, ring; II. black, sparkle, yellow, red, gloom, bright, green, white, shadow, pink; III. rat, spade, sheep, rake, nest, mouse, leaf, hen, cat, coat. Compare results.

While it is not desired that the use of one sense shall take precedence over another exclusively, it is yet often necessary to appeal to that sense which seems to have been used most by the pupil.

Tests of the nature proposed by Kirkpatrick may be supplemented by those in which numbers are used instead of words. The following has been used at Columbia University: "Each series of numerals in the following is read at a rate of about two per second, after which the student writes it from memory: 4 8 3 7 1 9 6 2; 7 5 9 2 6 6 4 1; 3 7 5 2 9 6 4 8. Expose the following at the same rate: 3 5 9 2 6 8 1 4; 8 5 2 7 4 6 2 1; 5 1 6 2 7 3 4 8." Try this list and have the students pronounce each as you uncover and at the same rate: 6 3 5 1 9 4 8 7; 3 9 4 8 4 7 1 2; 5 4 8 3 2 7 5 0. After each series have the children write all they can remember of the series. Devise a series and combine as many methods as possible and compare results. Suggestions as to methods in spelling classes should grow out of experimenting of this kind.

Different still is the device used by Binet (25) and Shaw (26). Read a short story. Ask the children to try to write as much of it as possible in the exact words of the author as possible. or select a series of sentences of different lengths and read.

Then ask that the children write as many as possible, using the exact words of the author as far as they can, but trying to give the sense of what was read. The results can be studied with reference to ability to remember exact phrases, the length of the phrases remembered, their character, etc.

A test suggested by Binet (6) seemed to him to bring out types of mind existing among the pupils. He showed them copies of a picture representing the story of La Fontain's fable, The Laborer and His Children. Two minutes were spent in the study of the picture and then ten were taken in writing a description of it.

The "descriptive type" took account of the most apparent characteristics without attempting to sieze their significance. Many described the photograph as if it were dead nature. The "observing type" fixed attention principally on the subject of the scene; they described it as a living scene. They put a story in it, or rather saw the story in it. The "emotional type" had the characteristics of the "observing type," but also saw the emotional elements in the scene. The "erudite type" simply résuméd the story.

Other pictures could be tried—those which represent a story which the children have heard, and again those pictures which are wholly new to them. The description of these would give a place for the exercise of the imagination and an opportunity to note its peculiarities in the children of the school.

Binet also placed a watch before the school and asked the pupils to describe it. He classified the sentences under the headings of description, observation, imagination, moral reflection, erudition, emotion—both the pure and the simple, and esthetic emotion.

How many things can a child hold in mind and deal with at one time? Are not many children confused with the long and involved explanation merely because of its length? Do not many fail with arithmetic work merely because of the number of details in the "example?" Careful every-day observation will do much to mark out this limit for each. Remember that drill within the limits of power with opportunities to show when the limit has extended, is an advisable method of procedure.

Bolton's (27) experiment in this field was made as follows: "A series of numbers in which the digits were so arranged that they did not stand in their accustomed order and no digit was repeated, was read before each class to be tested, on four different occasions." "The digits were dictated slowly at intervals at about 2-5 of a second with care to avoid rhythm or grouping; and at a given signal after the dictation of each number was finished, the pupils wrote the digits as they re-

membered them." Numbers of five, six, seven and eight digits were given. The results were studied with reference to the number of digits which could be grasped at one time.

Some evidence of a law of forgetting will likely appear if the character of the mistakes made is closely observed. Where confusion in writing the digits occurs, in what part of the number is it?

Bolton's test appealed especially to the ear memory for numbers. It would be of interest to repeat it by an appeal along different avenues already suggested.

The following (6) cannot be tried to advantage on the entire school at once, but presents some interesting phases. Select a number of ten different digits, *e. g.*, 9718025361. Allow the pupil to look at the number for five seconds, then let him try to reproduce it. He will likely fail. Let him try again. How many times must he be shown it, and how many times does he try before he can write the entire number from memory? Binet found wide differences in this between the ability of the bright and dull to do this. It is one of his tests for detecting the dull pupils.

How great is the ability of a pupil to fix attention (6) on any given things? The answer to this question will perhaps be difficult to obtain. All work is to some extent an index of this power so far as it exists in any given case. It is very largely conditioned on interest and physical conditions. The following necessitates very close attention as well as thinking and aids in marking out a limit in power to grasp a number of details. Give the pupil a sheet of paper on which three numbers are written, *e. g.*, 6—28—43, the three numbers being separated by dashes. Request the child to add one to each column and to continue the process, thus 7—29—44; 8—30—45, etc. As soon as each addition has been made cover it with a card. Continue the process during six minutes if the pupil does not show too great fatigue. At what stage are errors most numerous? How many additions were made correctly? A test in this line easier to make is this. Write fifty digits or letters in a straight line. Make them large and distinct and be careful that no order shall be followed in their selection which will make it easier to keep in mind one part of the series than another. Seat yourself by the pupil and allow him to look at the list with the direction that he is to see how many he can remember and write down. When he begins to write cover the paper and keep it covered till he has written all that he can remember. Let him then look at the list again. Cover the list when he begins to write, and repeat the process till he finishes. Note on a slip of paper how many digits he remembers each time and how many times he has to look at the list.

Compare results obtained from some of the bright pupils with those from some of the duller ones. Does this test seem to offer any index of mental brightness? (27) Similarly select a symmetrical design composed of 16 straight lines of different lengths, such as might be used in decorating the corners of pages or of book covers, and try the dull and bright in regard to the number of times they must examine the figure and try before they can reproduce it without having the design before them.

As a test for a thing which one has no special object in remembering show the pupils at some time during the day a 4 in. line, and then an hour later ask them to draw one just as long from memory. Or you may ask them to draw one just 4 in. long and an hour later ask that it be drawn from memory.

Jastrow tried with his university students this test for the memory of angles. With no other aid than that of ruler and pencil ask them to draw angles of 15° , 30° , 45° , 60° , 75° , 90° , 105° , 120° , 135° , 150° , 165° , 180° .

Or again a square of a given size, *e. g.*, 2 in. may be shown them and the pupils asked to draw one of the same size. In all such tests what is the percentage of error? Does it vary with age? With sex?

The "mutilated text" (10) test with Elsenhans's modifications is interesting because of what is promised for it. It may be used in the study of fatigue, the study of memory and the study of ability to think. Modified from Ebbinghaus's first plan it is as follows: A selection is taken from the reading book. From this many single words and syllables are omitted. Care should be taken to make the omissions of as nearly equal importance as possible. Have the pupils read the complete selection in their books just before the "mutilated" copies are given them. The ability to complete the text would then be aided by the memory. The contribution of which could be measured by the number of times the pupil would have to re-read the original page before filling out the "mutilated" one correctly.

A very good subject for the language class would be to write all that the pupils can remember that happened "when they were little." Supplement with personal recollections and classify facts obtained as pleasant or unpleasant memories, memories of things, persons, animals, places, activities, etc. What are the predominating lines?

The most elaborate attempt to study the memory of children seems to have been made by a Russian student, Netschajeff. (28) It is as follows:

1. 12 different objects were shown under the same conditions.
2. 12 different sounds were produced in succession before

the school, each being continued five seconds with an interval of two seconds.

3. 12 different numbers were pronounced under the same conditions. These numbers consisted of two digits each.

4. 12 common words of three syllables each with marked visual imagery were pronounced under the same conditions.

5. Similarly with 12 common words of marked auditory imagery.

6. Similarly with 12 words with either imagery of taste, temperature or pressure.

7. Similarly with 12 words with emotional imagery.

8. Similarly with 12 words of abstract character. After the giving out of each list the pupils wrote all they could remember.

A high degree of attention (6) is required to count a series of dots close together without touching them. Binet in this test arranged series having these different intervals, .70, .65, .429, .30, .25, .18, .144, and .10 cm. The corresponding number in each series was 13, 14, 15, 17, 21, 27, 29, and 45. Pupils known to have visual troubles should not have this test. Compare the results of the brighter with the duller pupils.

Perhaps even greater attention will be compelled with the effort to count the beats of two metronomes beating at different rates. Set one at 30 and another at 40 per minute. Explain that both will be started at the same moment, and that they are to count both during two minutes. Do not let the pupils know the rates. Have them record the results when you call time. Perhaps the rates will have to be made much slower for children. Adults find it difficult to count both when moving at rates greater than 50 and 60 per minute.

The observation and memory of much of the every day phenomena has perhaps some interest. Griffing and France (29) had children write answers to the following: What was the weather a week ago to-day? Which way do the seeds of the apple point? How many years ago did Gen. Washington die? How many feet is it from the schoolhouse door to the corner of the street? How many seconds does it take you to walk this distance? How many times have you entered the schoolhouse door since vacation? How many ounces does this text-book weigh? (showing a text-book used by the class). Draw on a scale of one inch to twenty feet a ground plan of the lower hall. Mark the degree of certainty you feel in answers. A when correct, B when fairly confident, C when doubtful, and D when guessing.

For some test in rapid perception Binet arranged a clock-work device controlled somewhat like a camera. This he used for the exposure of a series of words, the time of the exposure

being from .6 to .9 seconds. Taking pupil at a time he noted the number of mistakes, the number of times he had to expose each word before the pupil could tell it and the nature of the mistakes he made. Miss Aiken's book recommending such devices as the swinging blackboard will doubtless be recalled.

Association Studies. Several studies have been made of the tendencies in mental association. The questions of interest in this field are: At any given age what tendencies in association of words are prominent, from the part to the whole, special to the general, *vice versa*, according to the similarity of the sound of words, from an object to its qualities or *vice versa*, from one object to another of the same kind, from detail to detail, etc.? Just what tendencies are there in the associations formed?

Study in this field involves considerable drudgery. One of the easier tests would be to ask the pupils to write eleven words beginning with some concrete word like leaf.

Again write the following ten words on the board one at a time and ask the pupils to write with each word the first five they think of: book, man, tree, cat, hand, hat, bread, pen, write, blue.

Again select ten concrete words and ten abstract words. Give the children their spelling blanks and ask them to write, after your list has been placed on the board, the first word which each of the twenty suggests to them. This list can either be written one at a time or pronounced one at a time to the school.

Again taking the single word with which to start, or giving no word at all, ask the children for their spelling lesson to write during five minutes all of the words they can think of.

At what age is the greatest variety of words used? Do boys or girls use the greater variety? Dr. Jastrow and Miss Calkins who have studied this topic perhaps most, classified their results under the following heads: animal kingdom, wearing apparel and fabrics, proper names, verbs, implements and utensils, interior furnishing, adjectives, foods, vegetable kingdom, abstract terms, buildings and building material, parts of the body, miscellaneous, geographical words, mineral kingdom, meteorological and astronomical, stationery, occupations and callings, conveyances, educational, other parts of speech, amusements, mercantile terms, and kinship.

Any association study gives some insight also into the things that have in some way appealed to children's interests. (31) It is the old problem over again: how to separate any one power in order to study it alone. In a different way from the foregoing the problem of association has been studied notably by Binet, Barnes and Shaw. Out of Binet's

somewhat extended list of questions asked his two little girls at intervals during a period of some months, Barnes selected the following which he gave to California children: What is a knife? bread? doll? water? arm-chair? hat? garden? piece of sugar? thread? horse? table? mamma? potatoes? bottle? flowers? snail? mouth? lamp? bird? dog? carriage? pencil? earthworm? shoes? finger? clock? house? wolf? omnibus? village? box? handkerchief? His answers were classified under the following headings: use, larger term, action, quality, place, color, form, structure, substance and miscellaneous. It was also of interest to compare the results with the definitions given by Webster.

Shaw took the same list of words, and in making the test did not ask a question, but gave out each word and then wrote it on the board, directing each pupil to write down as rapidly as possible whatever came into his mind. In studying his results he found eight additional headings necessary: quantity or number, smaller class, similar object, time or occasion, associated object, like or dislike, possession, sentence making.

Still other phases of association may be studied by reviewing in any good psychology the laws of association and noting the frequency of the use of each in the conversation or written work of children.

Discrimination. Some measure of ability in discrimination may be made by the use of the following: Print several paragraphs. Make a copy for each pupil. Ask the pupil to draw a line across all of the letters of a certain kind, *e. g.*, the j's, or complicate the experiment by asking that lines be drawn across several letters, *e. g.*, the a's, s's, d's, f's. In case more than one letter is to be barred print them by themselves on the margin of the page. Note in this study the time required, the errors committed, the nature of the errors committed, whether barring the wrong letter or failing to bar the right one, etc. A fatigue study can be made of this by having the pupils draw a line to indicate their progress each four minutes. In this, as in all of the other studies, the ability of the individual should be compared with that of his mates.

In the study of ability to think note the readiness with which the children deal with the ordinary affairs of life, the ordinary problems, the emergencies, etc. How far can they trace a series of causal relations, say in geography or history? How about the memory of your best thinkers? Of what type is it? Are the children who do poor work in arithmetic good visualizers?

It is worth while to examine the following offered by Pearson as a scale of intelligence in children. There is much of interest in it.

1. Very dull. Capable of holding in their minds only the simplest facts, and incapable of perceiving or reasoning about the relationship between facts.

2. Slow dull. Capable of perceiving relationship in some few fields with long and continuous efforts, but not generally or without much external assistance.

3. Slow. Very slow progress generally; but with time and continual care progress will be made.

4. Slow intelligent. Slow generally, although possibly more rapid in certain fields. Quite sure of knowledge when once acquired.

5. Intelligent. Ready to grasp and capable of perceiving facts in most fields; capable of good progress without much effort.

6. Quick intelligent. Very bright and quick in both perception and acquirement, and this not only of customary but of novel facts. Ready to reason rightly about things on purely self-initiative. To this list Pearson thinks there might be added or inserted another class, the quick inaccurate. These classifications of course shade into each other. Yet the scheme is certainly usable.

So able a student of children as Kratz has the following blank filled out for each pupil in his schools: building, date, pupil's name, age, grade, health, nationality, temperament, general ability, sight and hearing. Twice each month a record is made of the following: observation, memory—verbal and thought, imagination, thought, leading feeling through which to govern, self-control, sense of right, use of language, subject of deepest interest, chief characteristic, greatest deficiency both mental and physical.

INTERESTS IN HISTORY.(33)

A number of tests have been made in different school subjects which have a bearing on the ability of children to think, and especially in the use of the causal relation. Notably should be mentioned those of Mrs. Barnes on the historical sense, the ability to make inferences and the sense of evidence. Her tests are as follows: "Name something that happened before you were born which you know is true, and tell how you know it is true." "How do you know that such a man as George Washington ever lived?"

"If you were shipwrecked on an island in the middle of the sea, and you found in one corner of the island an old house of logs, and a part of an old wooden boat, with broken arrows in the bottom of it, what would these things tell you?"

"There was a king who had a beautiful wife whom he dearly loved. But a fair prince came and took her away to a

far country. Then the king and all his men went to fight the prince, who lived in a great city all walled about with stone. For many a day the king and his men tried in vain to enter it; but at last, by a clever trick, some of his men got into the city and burned it to the ground, and so the king got his wife once more. What questions would you like your teacher to answer about this?"

"Which of these two accounts is the better, and why? Which would you keep if you could keep only one, and why?"

(a) The defence of Fort Sumter by Maj. Anderson was brave and stubborn. The garrison was under fire for thirty-four hours, the quarters being entirely burned, and the powder magazine being entirely surrounded by a ring of fire; starvation, too, was staring them in the face. Anderson therefore surrendered, saluting his flag as he marched out, with guns and drums and flying colors." (b) Dispatch from Maj. Anderson to the authorities at Washington: "Sir: Having defended Fort Sumter for thirty-four hours, until the quarters were entirely burned, the main gates destroyed, the powder magazine surrounded by flames, and no provisions but pork remaining, I accepted terms of evacuation offered by Gen. Beauregard, and marched out of the fort with colors flying, drums beating, saluting my flag with fifty guns.

ROBERT ANDERSON."

This test has not been found feasible for children under seven years.

Somewhere Mrs. Barnes has published a test which bears on some lines of interest in geography. She chose pictures of scenery in foreign lands and showed them to children without telling what they were. The children were then told to write out the questions about these pictures which they would like to have answered.

The tabulation for these tests of hers is perhaps fairly obvious. In the first one the things that happened may be classified in regard to their character, and the evidence in regard to its character—on what it is based, etc. In the second the character of the inferences may be studied as well as their number. In the third the questions will clearly define themselves and easily indicate a basis of classification—who, where, how, result, personal detail and feeling, general detail, ethics, time, number, truth. And in regard to the test in geography similar questions will be asked.

INTERESTS IN SPELLING.

Take the list of poor spellers and try to determine their type of mind. Are they eye-minded or ear-minded, etc.? Do the poor spellers visualize the form of words readily or not? Are

they close observers? You can most easily answer the last question by giving the class, as Miss Carman (34) did, a page from a reader—a page which you print off and in which are fifty words misspelled, for them to correct. Note the time they take and the percentage of errors—of words which they overlook.

Yet another question to be dealt with is that of the amount of time and frequency of spelling lessons. Draw on your own observation,—on your own school days and practice, and the experience of others. Does the policy of merely “keeping children at a subject till they know it” bring the desired improvement? Do five spelling lessons per week yield any better results than two? Does a long period given to the spelling class prove any more fruitful than the short period? Have you not among your acquaintances people who started to school late, perhaps when 14 or 15? What has been their success in learning to spell? Do your poor spellers make most of their mistakes in the first or in the last part of words? Habits in reading may have influenced them in this. It is possible to read and see very little of the last part of many words.

INTERESTS IN READING. (35)

Children's interests in reading have received a good deal of study. Librarians have classified the books which children have drawn and in their statistics are many facts of interest to the teacher. Talk this over with your librarian if possible.

The reading of pupils is such an important subject; so much depends upon it in the way of moral growth, future bent of interest, choice of occupation, the amount and kind of reading done, etc., that one should get clearly in mind the changes in interest that normally come with development, and should keep them in mind in the shaping of the course of study in reading.

This test was used with success some years since.

Give the names of all books you remember to have read outside of required reading for school work during the last six months, stating which, if any, you have read before. Where do you generally get your books? What is the most interesting book you have ever read? What books have you found most helpful? What most harmful? What magazines do you read most regularly? What ones are taken in your family? How many short stories do you read on an average each week? Do you talk over what you read with any one? Whom? Give the names of all papers and magazines that you read frequently or hear read? What ones do you like best? What parts do you read first and why? State as accurately as you can the number of books you read outside of school work. Write a sentence about one or more of the books that you have read.

Name some of the books you like best of all that you have ever read or heard read outside of school, and state how long since it was. What books have you read or heard read that you did not like, and state how long since you read them. What books shall you read next, if you can get them, and why? Write the subjects of all the lessons that you remember from the reader you used last year. Which one did you like best? What was it that you liked in it? If you could select just one book for your own, what would you take?

Select among these or other similar questions that suggest themselves to you, as many as you can use at one time and give them out as a basis for a language lesson.

It will also be of interest to take some book like "Little Men" or "Little Women," read it to your pupils and have them write during the period for the language class their "opinions" about it.

It is especially important to get the point of view of life taken by boys, notably the boys of the period from 12 to 17. The problem of discipline is rarely of consequence with girls. The girl the teacher can largely judge from her own point of view and recollection. She has seen how life looks through a girl's eyes, but the boy nature needs, especially by her, the most careful study. He is above all *the* problem.

INTERESTS IN ARITHMETIC. (36)

The ability of children to reason exactly is a wide field for research. It is not claimed that research work in this or any other field can do more than make some contributions toward any final solution of problems, but such work has a very important place in dealing with the general problem. The public holds mathematics, or rather arithmetic, in high esteem and is in the habit of insisting on its importance. Among the first problems that would be well to take up then would be one in which the public can give a great deal of help. Learn from your acquaintances just what subjects in the arithmetic they draw from in their everyday life. What does a housekeeper use? What does a business man use? What does a mechanic use? etc. If you are of the opinion that "the training in thinking given by a study of arithmetic is of great value" attempt the analysis of the thinking done in this subject. I find that most people who make that claim are quite at sea in this. And yet if the "mental training" of arithmetic has the value claimed for it, teachers should be able to see just what the forms of thinking gone through with are. Take your text-book on this subject and see if almost, if not all, of the problems do not involve the following: Reasoning from many to one, the value of an integer greater than unity being known

to find the value of unity—*e. g.*, If 4 pencils cost 20 cents, what should one cost? second, the reverse of the first; third, reasoning from the known value of one integer to the value of another; fourth, reasoning from the value of an integer to the value of a fraction; fifth, the reverse of the fourth; sixth, reasoning from the value of a known fraction to the value of another; seventh, reasoning from the value of an integer to that of an integral remainder, *e. g.*, a storm broke off 3-5 of a tree and left a stump ten feet high, how high was the tree? You are accustomed to think of these under the forms of the cases of fractions, or of the cases of percentage, or of those of decimals, all of which present the same kinds of thinking. You may add to these the thinking done in addition and subtraction and perhaps that in ratio, and you will have very little left, *i. e.*, in the formal phases of thinking in arithmetic of which so much is made in discussions on this subject. All problems will be made up of combinations of these, and here one must take into account, as suggested elsewhere, how many combinations the children of any given grade can deal with. Without taking up space to give the series of problems which I have used in testing I suggest that the following lines be studied: A series of problems in the comparison of numbers in which the numbers and fractions used shall be small, in order that the test shall be mainly on the reasoning involved; second, a series which shall involve the cases in fractions, and again the fractions and integers should be only large enough to make the children feel that the work is not too easy; third, a series of four problems in which the first shall involve only simple multiplication and division, the second only multiplication, division and addition, the third the additional step of subtraction, and the fourth, to include also ratio; fourth, a series which shall include nine problems, the first having two steps, say multiplication and addition, then let each succeeding one contain one more step from the fundamental processes, the point being to measure the number of factors in a problem with which the pupil can deal without falling into confusion by mere number of details. All such work can be given out during the period for the arithmetic work.

I ought to add also this point for study. How large fractions can the pupils of any given grade deal with to advantage? Similarly inquire concerning the size of the integers suitable for problems. Do you find that children increase in power more rapidly when you give them the large fractions and integers or *vice versa*?

It would be a very good problem for study and discussion to investigate how much of what is presented to the arithmetic class really remains with them for any length of time. For

some test of this give the class at the beginning of school in the fall the same questions used in the spring examination, or later in the year give questions which they have not heard mentioned in class for a month. Study the nature of that which has been forgotten as well as that which has been remembered. Is it really possible for children to reason much about things concerning which they have had no experience? About transactions not likely to come up in their lives for years to come?

Give them this set of questions: Have you a regular allowance? If not would you like to have one? If you had an allowance of 50 cents a week to do as you liked with, what would you do with it? How have you ever earned money?

INTERESTS IN LANGUAGE. (37)

There is an opportunity in the grammar and language classes to study something of ability to think. It is suggested by the last part of Sherman's *Analytics of Literature*. It will be a study involving considerable drudgery, but will help in getting a new point of view in language teaching. Assign the classes in grammar and "language" for their lesson an exercise in writing, taking for the subject something with which they are familiar and on which they have not been drilled, the purpose being to get from them sentences in which they give free expression to whatever are their tendencies in the use of language forms. Perhaps the topic mentioned on another page—their earliest memories—would be a very good one. Tabulate the papers with reference to the amount written, the number of simple sentences, compound sentences, complex sentences, and compound-complex sentences, also the number of each kind of subordinate sentences, the number of predicates per sentence, the average number of infinitives and participles, etc. You can add to this by noting the percentage of each. At what age do you find children using complex sentences with reasonable accuracy? Do you find that power in the use of the complex sentence increases with grade? Do you find the number of long involved sentences decrease with grade or is there not an increase of them in the seventh and eighth grades? All told do you feel that the current systems of language lessons give any added power in the use of language? Supplement a study of this kind with observation of the kinds of sentences young children use. Do not expect any written work of consequence from first and second grades. Supplement it still further by reading Sherman's later chapters, beginning with chapter nineteen. This will help you to see something of the historical order of the development of the sentence form in English. It may be still further supplemented by reading the biographies of a

number of writers of good English—not those of men and women of genius, but men and women of recognized ability. Let your questions in this be: How did they obtain their interest in good reading, how in expressing themselves well, what is there in their training that will be suggestive to a teacher of language and grammar? Perhaps it may also be of interest to see if there is any record of a school teacher giving them—any of them, their interest in good English, or did any develop their ability to write or speak well in the public schools?

When do children grow interested in some form of secret language, *e. g.*, the deaf and dumb alphabet, cipher alphabets, "hog" Latin, telegraphy, etc.? How should this tendency be utilized? Of what different forms can you learn from inquiry and observation?

THE PUZZLE INTEREST.(38)

There is a time in the lives of children when they take an interest greater than at any other in puzzles. Many of these can be utilized on the stormy day. They involve more or less reasoning, and give some test of the ability of children to think in dealing with the new or novel situations presented in these. There are the mechanical puzzles (I follow Lindley's classification), geometrical puzzles, physical puzzles, the arithmetical ones, the quibbles and catches, riddles, rebuses, enigmas, etc., parlor magic, and the logical and philosophical puzzles. Casel's Book of Sports and Games is full of them. The puzzle used by Lindley in his study is made as follows: Mark off a square and subdivide it into nine smaller squares of equal size. In the upper right hand square and the lower left hand square draw diagonals from the upper left hand corner to the lower right hand corner. In the upper left hand square, the central and the lower right hand square draw diagonals in the opposite directions. Trace *all* of the lines without lifting the pencil and without retracing any line. Here the problem is to trace the figure throughout without taking the pencil off of the figure. Draw it on the board on a stormy day and let the children try it and give you their papers with their results.

Here is another of a different kind that will make a good many of even your older pupils think pretty hard to succeed with it.

9XX) 4XXX4X7 (XXXX In this instruct the pupils to supply the place of X's with the proper figure and prove their work.

$$\begin{array}{r}
 \text{X}9\text{XX} \\
 \underline{\text{X}1\text{XX}} \\
 4\text{XX}5 \\
 \underline{2\text{X}7\text{X}} \\
 \text{XXX}4 \\
 \underline{\text{X}0\text{X}}
 \end{array}$$

INTERESTS IN DRAWING. (39)

Children's interest in picture making begins very early. It needs but little suggestion to arouse them to it. It is worth while before making any attempt to investigate this interest to turn back and think over your own interest in drawing, and also to discuss this with other teachers, exchanging experiences with them. Some of the important questions are: What use do children make of drawing when left to their own devices? Did your own interest in it survive? How do you account for the fact that so many lose their interest in it? How yourself, perhaps? Have you any acquaintances who have any skill in this line? Did they derive their interest from a course of drawing such as is generally given in the schools? How about the artist, does his biography show that he "got his start" from public schools? These questions are suggestive of lines of inquiry outside of ordinary school work.

What use do children make of drawing? How does it appeal to them? The first test of consequence, of which I know, used to find an answer to these questions was that of Barnes. He used a translation of *Hans-guck-in-die-Luft* from (Hoffman's *Streuwelpater*), selecting it because it was simple, short, contained no difficult object to draw, and did contain two distinct catastrophies. That the story was suited for this, and that it would appeal to children was assured because Hoffman had developed it through a long course of medical practice in his dealing with children. The story was read to the children, they were told to draw one or more pictures from the story, it was then read to them once more, and they drew what they wished. There was no conversation and no other directions were given. Any story which approaches these conditions or betters them will do for a similar test. Study with reference to the parts of the story which appeal most powerfully to the children, and note especially how many of each kind of pictures were drawn. In connection with this it is worth while to have a copy of Hoffman's book, even the translation, though that is a poor one.

Try reading favorite stories of children to them, and then ask them to make such pictures as they like about these stories. Classify these pictures according to conventional designs, persons, animals, birds, plants, trees, houses, utensils, engines, cars, stories, etc. Note any efforts at decoration, the use of the time relation, the absence of details in a picture, efforts at story telling by pictures, etc. Place, as already suggested, pictures before them and ask them to write about them. Among what class of your pupils is the tendency strong to put a story into the picture. Note the stages in which the types of mind stand out most prominently. Do children show traces of pass-

ing through a number of these stages, *i. e.*, are these types successive as to years?

In connection with this topic, likes and dislikes in color have been studied. This can be tested by asking children to write their favorites or by giving them opportunities to select among colors. If this is tried, colored cards, such as the Milton Bradley Company make, are very good. In this, use only cards having the principal colors.

Luckey(40) has made a very interesting study of the indirect range of color vision by the use of the perimeter. Seated at the instrument and looking straight ahead the children were to notice when a given color came within range, and report it. The order in which colors appear is of considerable interest.

INTERESTS IN NATURE.

For a language lesson give this: Write a list of the flowers and trees which children like and those which they dislike. Tell why they like or dislike them. Try to write a story about what trees do, what they say, what they feel, what they like, what they dislike, what they think of people, what they think of each other, etc. What stories do you know about trees? What trees are some children afraid of? Why are they afraid of them? Do you own any trees? What kinds?

Select and arrange somewhat similar questions in regard to birds, animals, and insects. Also recall your own and your friends likes and dislikes in these lines.

It is difficult to get at the feelings of children toward inanimate nature. Indirect means are generally the most satisfactory. Questions put under the guise of what they use to think or of what other children think are likely to be the most satisfactory.

Try this also: For your work now you may write out what children think the moon is for, or what some people think it is for, what it does, how it came to be where it is, what it thinks of us, what makes it grow large and again small, what used to be in the moon, how it makes folks feel, what signs there are about it, and any stories you may know about it.

Arrange similar points concerning the sun, the stars, storms, and clouds. Perhaps in telling all that the sun or moon does some trace of ability to see causal relations will appear that will be of interest.

Try this about stones: What do people believe about amulets, charms, lucky stones, precious stones and metals? Why are they worn? What ones are most desirable?

THE RELATIONS OF SCHOOL CHILDREN TO ONE ANOTHER.

Note the groups into which they seem to divide themselves

on the play ground and elsewhere. On what do these divisions seem to be based? Study the leaders of each group. What are their characteristics? Their likes and dislikes? Their reading? Their home environment?

Closely akin to this will be the disposition to organize gangs, clubs, or societies. It needs little to start children to making such organizations, but you might find them an embarrassment. Their views about such things can be gathered only with difficulty and tact. Your experience and that of your acquaintances will tell you something worth thinking over. It becomes a more and more interesting field. Study and classify the societies organized for children by adults. Get track of all you can by inquiry and reading—of those organized by children, and classify as secret, predatory, social, industrial, philanthropic, literary, art, etc.

Among the pupils will be found the quiet child. (43) He will make an interesting study. How old is he? So far as you can learn is he growing rapidly or not? Does he seem to be well nourished—supplied with an abundance of good food? Is he lazy? Self-conscious? Companionable? Does he associate with older children? Is he studious? Thoughtful? Sad? Gay? etc.

Again there is (43) the troublesome boy and occasionally the troublesome girl, but so rarely that this study may be thought of for the boy. Is he older than the average of his grade? Has he any physical ailment or defect? Well nourished? Overgrown? Or undersized? Has he any sense defect? Is his temperament a nervous one? Is he moody, sullen or obstinate at times? Are his parents of a nervous temperament? What is the most troublesome feature of his conduct? Does he use tobacco? What effort has been made either at home or at school to help him develop self-control? What right lines of work does he seem to like best? Does he have access to good reading? What was the temperament of the teacher whom he gave so much trouble in the past? Do his bad traits seem to be shown occasionally or continually? Just what are these bad traits?

Often most vexing to both parent and teacher is the (43) only child in a family. About him centers all of the life of the home, and it is not surprising that he gets an undue opinion of his own importance. Note his school attendance. Is it regular, or irregular? How does his work compare in quality with that of other children? Compare his likes and dislikes with those of other children. What are his best traits and what his worst? Has he mental or physical defects? Trying as are such children, one can have more patience with them after reading the article by Bohannon on this subject.

The peculiar and exceptional (43) child presses himself on the attention of the teacher. Here again Bohannon has something of value. Note these points: Is he exceptionally good looking or homely? Large or small? Any bodily deformity? Any sense defects? Any bodily weakness of which you know? Is he exceptionally strong, agile, clumsy or deft? Has he any special gift of the senses which you can determine? Look next on the psychic side. Is he exceptionally courageous or timid? Cleanly or dirty? Orderly or disorderly? Obedient or disobedient? Truthful or untruthful? Cruel or sympathetic? Selfish or generous? Talkative or silent? Frank or secretive? Buoyant or despondent? Dainty or gluttonous? Blasé or otherwise spoiled? A doubter, an investigator or critic? A buffoon or unusually serious? A restless, fickle, or scatter-brained child, or a tenacious one? A bad tempered or an unusually good tempered child? A careless, easy going or a fastidious child? An inquisitive, imaginative, or poetic child? A teaser or hector? A nervous child or apparently without nerves? A querulous child? A whining child? A dignified or self-poised child? Does he act habitually with abandon? Note especially if one trait or group of traits is so marked as to color the entire character making him generally noticed for them, and perhaps to be influenced by them in his future career.

The truant, (46) (48) and truancy is a feature of every school. Here we touch upon the motives and types of mind that are found among tramps. All have perhaps felt at some time of life impulses which unchecked might have led to the reform school or the truant school. Consider first your own childhood. Did you ever have a desire to run away? Or to leave home? At what age did such desire occur? What was the cause of it? Did you carry out your desire? If not, what prevented you? What treatment would you recommend for runaways and truants? Perhaps you were a truant from school at some time. Recall the motives that led you away. If you now excuse your conduct then, on what grounds do you do so? The same instinct that is sometimes at the bottom of the truancy habit shows itself in other ways. There are people who are said to have "a roving disposition." What is such a disposition? Others move frequently. Is it from some genuine necessity or the love of a new neighborhood? Then there is the inveterate visitor, call-maker, gad-about person who will not, or cannot stay at home. Study, if you have the opportunity, some such person. What does weather and season have to do with truancy? What the unusual event, like the circus? Would you make any modification of school work on account of anything of the kind, excursions, Saturday trips,

out-of-door recitations, etc. ? Perhaps you can get the children to write on the topic of truancy. Here again, however, the suggestibility of the children makes it important that the subject be approached with tact. The following topics would be of interest. Perhaps you can get the truant himself to write about them after the offence has been committed: *e. g.*, "What caused you to play truant? Where did you go and what did you do? What did you tell your parents? What did you like or dislike about school that made you play truant?"

It has been asserted that many truants are defective physically. Note any cases of which you may know in this regard. Are they shorter, lighter, less well fed than other children of the same age? Are they from the higher or lower grades of society? How do they compare with others in their school work?

There are always cases of chumming. Select some case and setting apart several pages in your note book make memoranda on the following: Find out first, if you can, without letting the children know it, why they like each other. To what extent are they together? What does each imitate in the other,—qualities, habits, actions, etc.? In which is the imitation more prominent? How far do they share their pleasures or work with each other? In what ways do they take part in each others troubles? Have they any common infirmity or fault, defects or enemy? What is the temperament of each? What breaks the friendship at last? It will be of interest, also, to think over the history of your own chumming.

Ask the children to write answers to these questions: What is the best kind of a chum to have? Why? What person of whom you have heard or read is it worth while trying to be like? Why?

CHILDREN'S IDEALS OF RIGHT AND WRONG.

What constitutes right and wrong in the minds of children? They will be found to have a pretty clearly defined list of things that are permissible, commendable, objectionable, things right under some circumstances and wrong under others. Their ethics may be ever so faulty, but it is well to know all about their views in order to try to lead to better things. It will be found that children pass through different stages in their attitude towards punishment. See if the following will throw any light on the problem: To-day you may write about a punishment that you once received, when you were little, that you think was unjust. Tell why you think it was unjust. Have you ever received a punishment that you deserved? What was it for? What punishment have you seen anybody else receive that was right? What was it? Why was it right? Classify

as to who punished, what the punishments were, what the offences were, and what the reasons for being just or unjust were.

On another day try this: What things are wrong for children to do, and how should they be punished for doing them? Should any offences not be punished? Why?

Again: One day the teacher left the room, and while she was gone several children in the room became disorderly. Hearing the noise the teacher came back, but did not know which children were to blame. None of the class would tell, so she kept the entire class in after school. Was that right or wrong, and why? Give this out under circumstances similar to that of other tests made.

Perhaps this can also be tried: Once a mother gave a child for a birthday present—the child was just six years old—a beautiful box of paints. In the afternoon, while the mother was busy in another room, the child painted all of the parlor chairs and then called out, “Oh, mamma, come and see how pretty I have made the parlor.” The paint could not be washed off, and so the chairs were spoiled. What should the child’s mother have said or done?

Normally a child grows away from selfishness to unselfishness. Conditions of health, age and environment are factors of considerable importance in this evolution. In your memoranda book note any cases that from time to time come under observation of unselfish conduct as you see it in children. Note in each case the age of the child, home and hereditary conditions so far as can be ascertained, and, although it will be very difficult to determine it, whether imitation, precept or any other than an innate generous impulse was the motive of the act. Note also the health of the child whether it is normally delicate, or active and vigorous. Do you find there are times when the same child varies, *i. e.*, is he now selfish and again unselfish? Does selfishness or unselfishness seem to predominate among the children of any particular age? What is the effect of stories of selfishness or unselfishness read to children? Study your own childhood in this regard, and compare what you get therefrom with your observations.

Try this: What was the best thing you ever saw one person do for another? Perhaps you have read or heard of something better. What was it?

The study of children’s lies cannot probably be approached directly. One can introspect and think over his own childhood as to just what telling a lie meant to him then, just when it was permissible to vary from the exact facts, how great the obligation was to tell the truth to enemies, how much one might embellish a story, or even invent one, etc.

This may be supplemented by observation of tendencies as they appear from time to time among the children, and should the situation at any time warrant it, the children may be asked to write answers to this: Is it ever right to lie or to deceive? Perhaps the results may not be what was hoped for, but society generally sins a good deal.

For general discussion such questions as the following are of value: What kind of moral ideas do children have? How do they come by them? How are they modified by experience? To what extent are they determined by environment? Are they developed by direct instruction by teachers? Or, do they arise through children's observation of their own conduct and that of their teacher's? To what extent does the Sunday School help boys of 13, 14, or 15 years?

Questions for written work may be helpful in getting children's point of view: What do people think it is to be good? To be bad? What things are right to do? What are wrong? Why is it wrong for anybody to steal? Why do not boys like to go to Sunday School?

Do girls or boys throw the greatest emphasis on what not to do? Does the ideal of right and wrong in the case of boys differ from that of girls?

What ideals have children in regard to enjoyment, right pleasures? Ask them to write out an account of the best time they had during the last vacation. What day can be recalled when they had the best time in their lives? What was it that made it so? What was the most unpleasant time? What was the funniest thing that they ever saw happen? Perhaps they have heard or read of something funnier. Let them write an account of it.

The study of children's ideas on theology is something that can in all probability not be taken up in public schools unless it is done in such an incidental way as not to attract attention from the community. Perhaps by talking with children individually when the occasion favors, it can be done. One might be able in a Sunday School class to have paper and pencil ready and ask them to write out their answers to questions like the following used by Barnes:

Where is God? What does he do? Why can we not see him?

Why do people die? Where do they go? Where is heaven? Who goes there?

What do people do there? What will children have or do there?

What is hell? What must a person do to go there? Where is it?

What do angels do? Why are some people afraid of ghosts?

What do some people think witches can do? Why do people pray? Why do we not always get what we pray for? Why do we go to church?

Why do we celebrate Christmas? What books or stories from the Bible do you like best? Why?

A new and rich literature has grown up in the field of moral and religious training in recent years. It will be well to get in touch with it. The following are suggested: Hall: *The Moral and Religious Training of Children and Adolescents*, *Ped. Sem.*, Vol. I; Burnham: *The Study of Adolescence*, same; Daniels: *A Study of Regeneration*, *Am. Jour. of Psych.*, Vol. VI; Lancaster: *The Psychology and Pedagogy of Adolescence*, *Ped. Sem.*, Vol. V; Dawson: *Children's Interests in the Bible*, *Ped. Sem.*, Vol. VII; Hall: *Children's Lies*, *Ped. Sem.*, Vol. I; Hall: *Moral Education and Will Training*, *Ped. Sem.*, Vol. II; Barnes: *The Theological Life of a California Child*, *Ped. Sem.*, Vol. II; Starbuck: *The Psychology of Religion*; Coe: *The Spiritual Life*; Ellis: *Sunday School Work and Bible Study*, *Ped. Sem.*, Vol. III, p. 363; Atkinson: *Child-Study in Secondary Schools*, *School Review*, Vol. V; Burnham: *The Psychology of Adolescence*, *School Review*, Vol. V; Scudder: *Childhood in Literature and Art*, Houghton, Mifflin and Co.

Many children have fears that (44) trouble them a great deal. Encourage them to tell them to you. You will not only learn much of interest, but will also help to dispel the fears merely from their being told. Try this: "You may write for your exercise to-day some account of the things of which some children are afraid. Tell how they came to be afraid of these things. Do you know how old they were when these things first frightened them, and also when they were no longer afraid of them. Were there any things of which you used to be afraid of? You may write all about them." These fears may perhaps be classified as connected with the phenomena of the heavens, of inanimate objects, of animals, insects or reptiles, of people, of darkness, solitude, ghosts, etc., of pictures, or fairy tales, of conscience or religious fears, of illness, disease, friends, loss of position, or health, etc. Gather data from the experience of others.

The sense of honor among children can be studied by observation perhaps better than by direct discussion of the subject with them. An important study of this field by Prof. Clark will soon be published. Make memoranda of cases you have noticed and of those you recall in your own childhood. What class of children best illustrate this theme; good or bad; boys or girls; rich or poor; bright or dull; city or country? What differences have you noticed in nationalities? Note cases of honor in games of any kind. What devices or methods of discipline by

which appeals to the sense of honor have been made do you recommend? Does it retard or assist obedience? What individual differences in the sense of honor of young persons may be due to the like or dislike of the teacher or friend involved; to the lessons or sports; to home life? How much of it depends upon a keen sense of truth and honesty? Compare your observation of children with cases of professional honor among teachers, clergymen, doctors, lawyers, and business men.

MISCELLANEOUS.

Success in teaching is rather to be measured by ability to foresee and prevent the undesirable than in smoothing over after the trouble has happened. The dull, the troublesome, the unattractive children present in themselves most fascinating pedagogical problems, and interest should be taken in such children promptly in order that they too shall develop the characteristics found in bright and clean children.

Keep children's attention turned outwards. Utilize and direct activity. Check it, pen it up and it overflows, breaking out in unexpected places. Children generally do not have enough to think about. Even fads have their advantages. Stir up interest in future possible employments. Try this exercise: What trades and occupations are desirable to be followed when boys and girls grow up? Why? What particular one would be most desirable? Why do some children quit coming to school so early?

(46) Keep a careful record of the weather and the conduct of the school. Do you find that there seems to be any relation between the windy, rainy, or otherwise stormy days and the conduct of the pupils? Keep some tab on your own feelings on such days also.

(47) Again: Ask the children to write for a language lesson this: Recall all of your teachers down to the time you came to school to your present teacher, and tell all you can about the one that helped you most. How did she do it? Do not name her, but describe her.

Again let them write, this time on the question, How do grown up people differ from children?

There is a period in the lives of both boys and girls when a changed attitude, often for the better, sometimes for the worse for a while, comes over children in regard to dress. Be watchful for it and notice evidence of care, neatness, and taste or the reverse. Note their favorite colors and love of adornment, and do not be severe on it. So great is the teacher's influence that she should never forget that the old teacher, both male and female, is very prone to lose ability to dress tastefully, so that it becomes possible generally to tell them by their peculiarities of dress.

The sense of time develops very slowly. By using Mrs. Barnes's tests you will get something in that line. Supplement that by the use of the following: asking the children to write: One day, when I was about seven years old, I went to a neighbor's to play, and my mother told me to be back by six o'clock. I was enjoying myself so much that I did not know how the time was passing, until I noticed that it was getting dark. Then I ran home as fast as I could, but it was half-past six when I reached there, and the family had been to supper. Would it have been just or unjust for my mother to have scolded me for being late, and why?

Some children enter school late. It is easy to learn of people who in their childhood also entered school late. An interesting study may be made of all of these by ascertaining the following facts: The home life, general environment and physical condition of the child before and after entering school, the age at which regular attendance at school began, some estimate of the school attended—if you are not already familiar with it, the progress of the child as compared with others of the same age who entered school about the usual time.

Little study has yet been made of the development of the will as such in children. Miss Merrill has used the following: Give instances where you have allowed a child his choice in any matter. State the circumstances. Did he desire to choose? Did he choose promptly? Was his choice independent or influenced by others? Under the same conditions did he always choose in like manner? Have repeated acts of choice made him readier to choose? How has this affected the child's habits of obedience? Did he become willful, or was he ready to submit when choice was impossible? Give any other details showing immediate or remote effects.

Suggestibility. (45) The readiness with which some children will take a suggestion and others will not, and the readiness with which even a very great many older people at once think of the very opposite thing from that mentioned and desired to be done is one of the interesting phases of human nature. It needs to be taken into account in all study of child life. Does it make any difference who proposes a given game or piece of work, in the readiness with which it is taken up? Does too great willingness to accede to a request always lead to the privilege being used to the utmost? Have you not sometimes had to make the suggestion first that such a thing has been proposed but that there are doubts concerning it in your mind, before you could get any great number to be willing to take up what you wanted done voluntarily? How many times have you had to get some one else to make the desired suggestion before it spreads through the school and comes up to the teacher

as a request which she will please grant? To start the suggestion, to keep it growing and to grant the permission at the right time smooths many of the rough ways of school discipline.

What pupils will take a suggestion from you most readily? What ones cling most to their own opinion, refusing persistently to change their minds? Observation during the first week alone tells of those who insist most strongly on doing their own thinking, or in thinking the very opposite from what the teacher or text-book insists. Take the teaching of temperance as it is usually attempted in the schools. Does the fact that from two to three times a week, from the high school to the kindergarten, children are warned against the evils of tobacco, liquor, opium, and gum chewing really deter from these habits? The girl with her inborn tendency to do what is generally right and proper will conform, but how about the boy? Observe the older boys and men and ask when occasion offers what they think about it? Read in any good psychology the chapter on suggestibility and imitation. The best book on the subject summing up investigations and giving many tests is that of Binet, *La Suggestibilité*. Most of his tests were given to pupils taken singly in a room by themselves. Among the more interesting tests may be tried the following: In this the purpose is to give a suggestion of increasing length of lines. Arrange a series of twelve lines, the first twelve mm. long, the second twice as long, the third three times, the fourth four times, the fifth five times, the sixth the same as the fifth, the seventh six times as long as the first, the eighth the same, the ninth seven times as long as the first, the tenth the same, the eleventh eight times as long as the first, and the twelfth the same. Show them to the pupils one line at a time. After each line has been seen ask the pupil to take the strip of paper which you give him and indicate on its edge the length of the line he has seen. Take a different strip each time. Make no comments on his decision. Has the effect of the constantly increasing length down to the sixth led him to make the sixth, eighth, tenth or twelfth lines longer than the immediately preceding ones?

This test can be repeated with a set of lines in which they are arranged in a geometrical increasing ratio.

Another device is this: Draw a series of parallel lines thirty-six in number. Make the first twelve mm. in length, the second twenty-four, the third thirty-six, the fourth forty-eight, the fifth and all of the others sixty in length. Try as before. How far down the list will the suggestion made by the first five lines be carried? To what extent are the lines reproduced exactly?

Similarly a set of weights may be arranged.

In these tests the suggestion is given by the lines and weights themselves. Another may be tried and a suggestion given by the teacher. Arrange a series of colors in which the first is blue, the second gray blue, the third greenish blue, the fourth bluish green, the fifth green, the sixth yellowish green, the seventh olive green, eighth yet more yellow, and the ninth golden yellow. Show the pupils first, cards having the ordinary colors on them in order to determine whether any cannot name the colors correctly. Arrange the nine colors selected on pieces of white card board, giving the same space on each to the color 3.5cm. x 2.5cm. Ask the pupil being tested to look at the card you lay before him, then to name the color distinctly and then to write its name. When he reaches the green card and so pronounces it, say in as quiet a matter of fact way as possible "no, blue." Try this with the succeeding colors also. Note the classes into which the pupils fall. Binet finds those who take the suggestion at once and call the green blue, then those who appeal to you to decide it and lastly those who announce their own opinion most conclusively.

A series of twenty-four lines may be prepared on a sheet of paper beginning at the left hand side. Make these seven mm. apart. Make the first twelve mm. long, and increase the length of each by four mm. Number each. Ask the child to examine the page with the lines. On three separate slips of paper of the same size have a single line, the first thirty-two mm. long, the second fifty-six mm. long, and one eighty mm. long. Taking line at a time ask the pupil to pick out one of the same length. When he has decided say, "Is it not the one above?" or "Is it not the one below?"

Binet says that all experiments in this field are according to the following formula: There should be made at first several sincere tests, for example, several short problems, each solved in the same method. Follow these with a problem which is like the others in form, but which has a different process involved. How many will be misled by it?

A stimulus of light, sound, touch, or indeed through any of the senses may be given in good faith, then the signal for the stimulus may occur as usual, but the stimulus not be given. How many will think that they notice it any how? Scripture tried this with a mild electric current. Small bandaged the eyes of subjects and struck matches, waving them back and forth over the back of the hand, and again striking the match, but waving only his hand. He also tried this for illusions of touch. Marking off a square on the back of the hand the eyes of the subjects were bandaged. Taking a finely ravelled thread he said to the subject, "We will try the area named first. I

am bringing the thread down toward it. If you feel it, I want you to tell me what the sensation is like. There, if any one were touching my wrist I should feel the lightest little touch imaginable. In a moment it might grow plainer as if a mosquito were alighting on the spot, and it might change to an itching as though a mosquito were just beginning to bite."

Similar suggestions of perfume may be given.

It is possible to work out extended lists of what might be done in the study of phases of child life in literature, art, and religion. To show something of this the following are suggested: A reading and discussion of personal journals and autobiographies such as the Journal of Marie Bashkirtseff, Pierre Loti's Romance of a Child, John Stuart Mill's Autobiography; childhood and adolescent phases of great men such as Voder (50) published,—of the artists, musicians, inventors, engineers, soldiers, scholars, and statesman; of the child types of the literature of any given period; of those in the writings of any given author such as Dickens, Thackeray, Eliot, Stowe; of those in the art of any given period; of the Christ child as shown in the different Madonna pictures; and of those in poetry such as Field's, Longfellow's, Wordsworth's, Kipling's, and Stevenson's, and of primitive races. (49)

It has been the purpose in this paper to stimulate what Dr. Burnham has called "the spirit of the learner," to arouse interests, and to do something towards pushing to an indefinite distance into the future the time when the student shall have formed a hard and fast educational creed. Child-study has its contributions bearing upon the solution of the great problem of education, but so have very many other fields of knowledge. It is but one of many factors which must be taken into account in making up a final result. Greater certainty might have been expressed with regard to tests, and the probable results might have been indicated, but that would have been contrary to my general purpose which has been to suggest and start thought in right directions, not to tell what results ought to be reached.

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