

VOL. III.

THE

No. 9.

CHRISTIAN EDUCATOR

A SCHOOL AND HOME MAGAZINE

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The Christian Educator

IS DEVOTED TO

The Thorough, Systematic, and Symmetrical Culture
of the Hand, Head, and Heart, in the
Home, School, and Life.

Edited by FRANK WILLIAM HOWE.

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NOTICE

The new arrangement of our standing Departments in the EDUCATOR:—

Editorial.—Special paragraphs and topics, references to contents, etc.

General Articles.—From our contributors, including at least one illustrated article in each number.

Word and Works.—Including special studies by Dr. E. J. Waggoner, the Editor's series on "Bible Psychology," on "Science Studies" by Dr. O. C. Godsmark, and other contributions by well-known writers.

Home and School.—Devoted to parents and teachers, church schools, class-room methods, observations, reports.

Physiology.—Continuation of Dr. A. B. Olsen's valuable series of practical lessons, contributions by other physicians, selections, etc.

Seeing and Doing.—Devoted to nature-study and manual-training interests. Frequent contributions by Prof. W. W. Prescott, Mrs. E. M. F. Long, Prof. M. E. Cady, and others. (Begins in May.)

Note and Comment.—Items from the colleges and academies, correspondence, criticisms, answers, reviews, publishers' announcements, "Queries," etc.

OUR SPECIAL COUPON OFFER

Expired by limitation on May 15. EDUCATOR readers will be glad to know that it has been the means of a large increase in our subscription list, yet not so large as it ought to have been. Many did not seem to "wake up" to the meaning of the opportunity while it lasted, and then sent their orders hustling in on the last day of the original period stipulated. The extension of the time until the middle of May is showing the same results,—the incoming of orders constantly increasing as the limit is approached. We doubt not that if this limit should be advanced from month to month we should still have hundreds of orders coming in on the last day of each.

But the EDUCATOR can not afford to continue the lower price indefinitely. The offer was made as a special inducement for a limited time in order to get all our friends at work for new subscribers. Some sent in the full price of the magazine, feeling that this sum does not represent its yearly value to them. We venture the opinion that no fifty-cent educational journal in the world furnishes more solid and instructive matter, and less irrelevant advertising, than does the CHRISTIAN EDUCATOR. And when the special nature of its contents is considered, there is no other that stands equal to it. Think about that for a moment, and see if you do not indorse the statement. The EDUCATOR has become a necessity to all who wish to keep pace with

the general interests of our educational work. Perhaps the publishers have not emphasized and reiterated that fact as much as should have been done. But the unsolicited statements of our friends confirm and encourage us in the continued effort to make the EDUCATOR so valuable to all our readers that they will feel constrained to add their personal friends to the growing list of our regular subscribers.

The steady readers of any journal can do more than any other agency to increase its circulation, and thus insure for themselves as well as others a larger, better, and cheaper paper. The EDUCATOR could be sent to every one indefinitely for only twenty-five cents a year if we had more subscribers. So we trust that every one who is receiving it at that price will feel it a privilege to introduce the magazine to all his neighbors. It matters not what is their religious belief, or non-belief, the EDUCATOR may be a blessing to every family that reads it; and many will read it with profit who would not be interested in any other periodical. So we have decided to help you in this good work by making

ANOTHER SPECIAL OFFER

If you have not already taken advantage of our 25-cent Coupon Offer, or if your subscription is not already paid until January, 1900, we make this

(Continued on third page of cover.)

THE CHRISTIAN EDUCATOR

A School and Home Magazine

Edited by FRANK WILLIAM HOWE.

Vol. III.

MAY, 1899.

No. 9.

GEMS FOR THOUGHT.

[From "The Desire of Ages."]

EVERY one passes judgment on himself.

EVERY child may gain knowledge as Jesus did.

THE life of Jesus was a life in harmony with God.

IF we are Christ's, our sweetest thoughts will be of Him.

HE was perfect as a workman, as He was perfect in character.

AT the cross of Calvary, love and selfishness stood face to face.

TRUE education would lead the youth to "seek the Lord, if haply they might feel after Him, and find Him."

No truth essential to our salvation is withheld, no miracle of mercy is neglected, no divine agency left unemployed.

HE acknowledged the tie that bound Him to the home at Nazareth, and performed the duties of a son, a brother, a friend, and a citizen.

IT requires much patience and spirituality to bring Bible religion into the home life and into the workshop, to bear the strain of worldly business, and yet keep the eye single to the glory of God.

THE more quiet and simple the life of the child:— the more free from artificial excitement, and the more in harmony with nature,— the more favorable is it to physical and mental vigor and to spiritual strength.

THE parables by which, during His ministry, He loved to teach His lessons of truth, show how open His spirit was to the influences of nature, and how He had gathered the spiritual teaching from the surroundings of His daily life.

THE heart of the human father yearns over his son. He looks into the face of his little child, and trembles at the thought of life's peril. He longs to shield his dear one from Satan's power, to hold him back from temptation and conflict. To meet a bitterer conflict and a more fearful risk, God gave his only begotten Son, that the path of life might be made sure for our little ones.

Every one who decides to take advantage of "Another Special Offer" (see opposite page), is requested to write at once to the "Educator" whether you will try for five, ten, or twenty-five new additions to our list. We may help you. Perhaps you need further explanations or suggestions. Write right away anyway.

CHANGE OF ADDRESS.

IN asking to have the address of your CHRISTIAN EDUCATOR changed, it is necessary not only to give the old address with the new, but also to send *your own name* as well. We have received a postal card containing only these words:—

5 | 1 | 99.

Kindly change the address of my "Ed" from Cleveland, O., to Bedford, O.

— Which we should be very glad to do if we knew *who* sent the card. Cleveland is rather a large city, and there are many postal cards sent out from it every day. The probability is that if our subscriber will send his request in a letter, duly signed, his identity as the writer of *this* postal card will never be found out. Try it.

WE are still grieved to see the kind of English that sometimes finds a place in educational journals. The last number of *The School Record* (Detroit) asks: "Is your geography lessons uninteresting?" That final "s" *might* have been a compositor's error; but the same journal said last June, "The time of the summer institutes are at hand." A little further down the same column, in the last issue, is this elegant advice: "Now is a good time to let up on your nagging of that troublesome boy." But the following is an item as interesting as any other: "Any school desiring the Legislative Journals, can have them mailed to their school by applying to your representative." Whereupon we venture to remark that any paper that will allow *their* paper thus to bungle the King's English, ought not to be accepted as *your* school paper.

SPECIAL NOTICE.

THE publishers of the EDUCATOR will send this magazine three months to any subscriber who will supply us with copies of the November EDUCATOR for 1897, the April number for 1898, or the February number for 1899. We need these issues to fill out complete files that have been ordered. Our friends can assist themselves and us by mailing these numbers to the EDUCATOR, and sending a postal card so that proper credit may be given.

MORAL EDUCATION.

THE Superintendent of Public Instruction of North Dakota says: "Man, the highest and final creation of the Infinite, is a triune being, body, soul, spirit, these three in one," and that "to glorify his Creator he must be so developed that his three-sided being becomes a completely harmonious whole." This conception of education is coming to be very generally entertained, though as yet vaguely understood. It is generally conceded that a harmonious, symmetrical education requires a training of the body, soul, and spirit; but the nature and relations of "these three" are very dimly discerned. The same writer goes on to say that "The spirit is that undefinable power which presides over all and directs the soul in governing the body." This appears to make the spirit a kind of independent, intangible something hovering over and directing the soul and body, but not a part of the "triune being." How can this kind of spirit be subject to *educational influences*? How can it be trained as a part of the composite unity in the human being? If above all, the spirit would seem to be beyond the reach of educational agencies.

If this spirit is of superhuman origin, *presiding over* the individual and directing his moral **conduct**, then man is only a *dual* being of soul and body, which accords with the older conception. But it has become an equally popular conception that man consists of a physical, mental, and moral nature. And it is impossible to conceive that he is either more or less than this. This conception agrees both with philosophy and with the Scriptures. Man's moral nature *belongs* to him, and is a *part* of him as truly as the physical and the mental. Then we must in some way identify the "physical, mental, and moral," with the "body, soul, and spirit."

Preceding articles in the EDUCATOR have clearly established this identity. The body is the physical element in man's nature; the soul is the living, thinking element; and the spirit is the product of the union of the other two—the individual character or moral element. The spirit can be trained and educated, but only by training and educating the body and the mind. The inevitable product of this education is *character, spirit*, of some kind. It may be uplifting and helpful, it may be *severe* and malignant, or it may be pale, weak, almost a zero,—yet it is *all there is* of the individual's worth to himself and to the world.

In a sense it is true that this spirit, whatever it may become, "presides over" the development of the individual while yet a part of him. Every man is dominated by his own character. He is *to be* what he has made himself. His character (spirit) is developed little by little, and constitutes himself. His character for to-morrow, next week, or next year, is the product of the living and thinking of to-day. And the only way by which the spirit can be rightly educated is daily to submit the body and the mind to the natural workings of the divine law. If the body and the mind are properly fed and exercised, the character produced will be a copy of the divine image. Bible psychology gives a definiteness and interest to moral education that can not be secured by the occasional telling of mythical stories or the mere memorizing of ethical maxims. The instruction that is effective for good must take hold upon reality and be adapted to the needs of daily experience. And the truth of reality is found only in the Word of God.

CHRIST in his word calling to self-sacrifice, in the poor and suffering who plead for relief, in the righteous cause that involves poverty and toil and reproach, is no more readily received to-day than he was eighteen hundred years ago.

IGNORANCE OF THE BIBLE.

THAT many other and less important subjects have been pursued in school to the neglect of Bible study, is a fact that is coming to the consciousness, if not the conscience, of many educators. Professor George A. Coe, writing in the *Christian Advocate*, gives an interesting account of a test experiment made with about one hundred college students. They were requested to write answers to the following questions:—

1. What is the Pentateuch?
2. What is the higher criticism of the Scriptures?
3. Does the Book of Jude belong to the New Testament, or to the Old?
4. Name one of the patriarchs of the Old Testament?
5. Name one of the judges of the Old Testament?
6. Name three of the kings of Israel.
7. Name three prophets.
8. Give one of the beatitudes.
9. Quote a verse from the letter to the Romans.

With the exception of the second, these questions call for only very elementary knowledge of the Scriptures; and the students addressed were presumably all reared in so-called Christian homes. They were given the benefit of every doubt, and their answers accepted as correct if they showed "even a distant approach to definite knowledge, whether technical or only popular." Eight students answered all the questions correctly; 13 answered 8 of the questions; 11 answered 7; 5 answered 6; 9 answered 5; 12 answered 4; 11 answered 3; 13 answered 2; and 3 answered none. 60 students answered the first question correctly; 16 correctly answered the second; 56 the third; 61 the fourth; 45 the fifth; 47 the sixth; 52 the seventh; 76 the eighth; and 31 the ninth. On the average each student answered less than one half of these nine simple questions.

How indefinite and uncertain is the common knowledge of Biblical facts is shown in nature of the blunders made in this test. Among the judges were named Solomon, Jeremiah, Daniel (doubtless 'a Daniel come to judgment!'), and Leviticus; among the prophets, Matthew, Luke, and John. Herod and Ananias appeared as kings of Israel. Nebuchadnezzar figured as both judge and king of Israel. The Pentateuch was confused with the Gospels, and in one case with "the seven gospels." Among the beatitudes were the following: "Blessed are the poor in heart, for they shall see God;" "Blessed are the law-givers;" and

"Blessed are the hungry, for they shall be fed." Several writers agreed substantially with one of their number, who defined the higher criticism as "the criticism by scholars who attempt to overthrow certain doctrines as taught in the Scriptures." In the face of such misinformation it was refreshing to find a number of statements like the following: "Higher criticism means a critical literary study of the original texts, to ascertain what is the authorship of the books of the Bible, when written, and how much is interpolation."

The results of such a test call for little comment by way of admonition or exhortation; they speak for themselves. If the EDUCATOR carried no other theme than the restoration of the Bible to its rightful place in true education, its mission would deserve the strongest possible support. And in making the Bible the foundation of educational effort—not merely the memorizing of Bible facts, but the application of Bible principles—all other needed reforms will follow in due course.

A word should be added in reference to the second question in Professor Coe's list. Not a little of the prevailing disregard for Bible study is a natural consequence of the popular acceptance of the results of so-called "higher criticism." The best and wisest criticism has always tended to strengthen belief in the inspiration of the Scriptures, a "doctrine" taught in the Bible itself; but unfortunately such criticism usually goes "over the heads" of those who are most in need of strengthened faith. However praiseworthy may be a reverent, "critical, literary study of the original texts," its effect upon the popular mind has often been "to overthrow certain doctrines" that supported confidence in the divine origin of the Scriptures.

The moral of all this is, Study the Bible for yourself, in your own language. A critical (careful) study of the original may be a great help; but no one in this age of the world need be dependent on professional scholars or theologians for an adequate understanding of the Word of God for himself. And this personal study is the surest safeguard against accepting "for doctrines the commandments of men."

731 S. ROSE ST., KALAMAZOO, MICH.,
May 1, 1899.

To the Editor:

If your paper maintains the high standard of the March and April numbers, I think it will be indispensable to every one interested in "higher education." I especially commend the personal nature and value of the "Queries for Students," "Criticisms," and "Don'ts."

R. R. HILBORN.

INDUSTRIAL WORK IN UNION COLLEGE.

W. T. BLAND.

UNION COLLEGE, near Lincoln, Neb., is now closing its eighth year's work. A glance over this brief period is sufficient to indicate that there has been more than a human hand at the helm. During this time there have been crop failures and great financial depression throughout the West, yet while the College was for a while seriously affected, its work has not been stopped, and to-day its future prospects seem brighter than ever before.

At the beginning, the courses of study were the same as those of Battle Creek College, three in number,—Classical, Scientific, and Biblical. From year to year these courses have been remodeled, strengthened and increased in number, so that for the coming year there will be offered ten practical courses. In making changes the plan has always been to drop nothing until something better could be put in its place, and to-day the courses are

stronger and more practical than ever before. The Literary and Scientific Courses, leading to the usual degrees, are offered to those who desire to do thorough college work, and who wish to prepare themselves to teach in our larger institutions.

Special courses are provided for those who wish to fit themselves for any particular line of work. Thus the College is an institution doing not only thorough collegiate work, but it is a practical Training-School as well. This year it graduates one of the largest classes of any school among Seventh-day Adventists. These young people are all trained for places of usefulness in the denomination.

Believing that education is deficient if any part of it is lacking, and that the physical is just as important as the mental, the College has opened several departments of work leading to various useful trades. These do not include the ordinary work about the institution that is furnished to all the students, and for which they are paid ten cents an

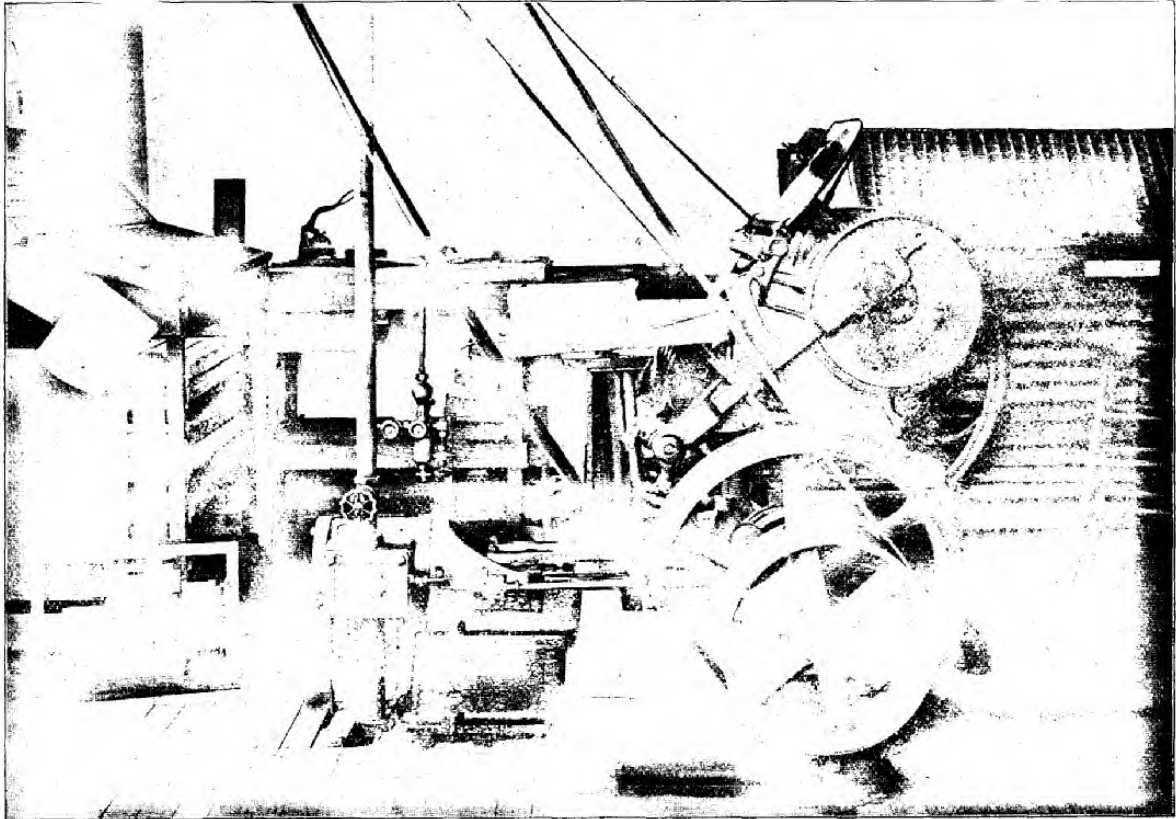


THE BLACKSMITH SHOP.

hour in cash, but special lines of work which a student may pursue under a competent instructor until he learns a definite trade.

Although, strictly speaking, agriculture is not included among the "trades" or "professions," yet it is of so much importance that it is worthy of special mention here. There is perhaps no kind of work upon which so much study may be placed as that relating to the soil and its cultivation. During the past year a number of students have been fur-

trade, but have been able to earn sufficient wages to meet their expenses in school. During the past year, twenty-five acres of broom-corn was raised on the College farm, all of which has been used in the broom factory,—made up into finished brooms and sold in the market. The College has experienced no difficulty in disposing of all the brooms that could be made to the merchants in the city of Lincoln, so that it has not been necessary to make any shipments. In fact, it was hard for the boys to keep



A CORNER OF THE PRINTERY.

nished work on the College farm. Four hundred acres have been cultivated, and the usual crops of grain and vegetables raised. Different kinds of vegetables were produced in sufficient quantities to furnish the College tables with a wholesome dietary. Several thousand bushels of corn, wheat, and oats were marketed at a good price. A dairy herd of about thirty cows is kept, furnishing milk not only for the College, but also a large quantity for the market. During the winter months regular class work in agriculture and kindred lines is carried on.

For two years the College has conducted a broom factory that has done very profitable work. A number of students have not only learned a useful

up with the orders; at one time they were one hundred dozen behind because of the special demand for College brooms.

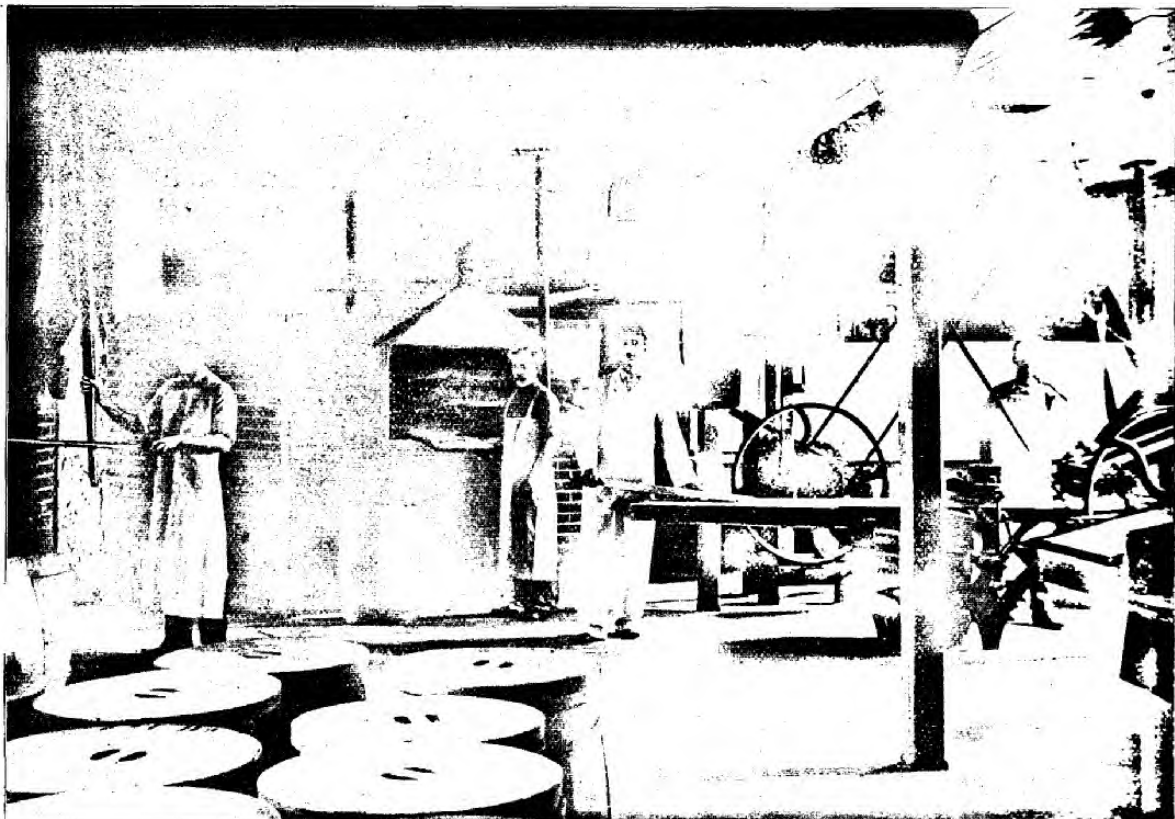
During the present year a blacksmith shop has been erected and work in this line profitably carried on. Not only is the College blacksmithing done here, but outside work has been taken in as well. Four young men have been working at the trade under an experienced smith, who is also a student in College. As in the other trades, the boys are earnest Christian young men who believe that by devoting a part of their time to this kind of work they are rendering acceptable service to God, and are themselves receiving more benefit and better

exercise than they could to spend the same amount of time on the football ground. We do not question that their minds are clearer and their sleep sounder.

Printing, bookbinding, and publishing have also

The profits from this department amount to several hundred dollars a year.

Besides the trades already described, work in wood and iron has been introduced during the present year. Turning lathes for both iron and wood



THE BAKERY.

been introduced during the present school year. Several students have had regular work in typesetting, correcting proof, presswork, etc. From the first the printing-office has been crowded with work. Besides publishing the *Practical Educator*, the College local paper, a large amount of job work, both for the College and outside parties, has been turned out. The press is run by steam power, and the work done has been very creditable. The Scandinavian teachers and students have furnished the appliances for bookbinding, and are prepared to do regular work in this line.

For several years the College has manufactured and shipped "health foods" in large quantities. By using only the best material, doing first-class work, and selling at reasonable prices, the bakery has established a large trade, both wholesale and retail. All kinds of health foods are manufactured and shipped to any part of the country.

have been purchased, and connected with steam power. Saws and drills have also been set up, and the College is thus able to give instruction in a number of lines of useful employment.

Altogether, the introduction of the trades has brought new life into the College. A higher ideal is constantly held before the students than when all their exercise was obtained from the playground. Students are able to acquire a knowledge of some useful trade or occupation, and at the same time help meet their expenses while obtaining their education.

Perhaps one of the most interesting features of the industrial work, at least to a large number of the *EDUCATOR* readers, is —

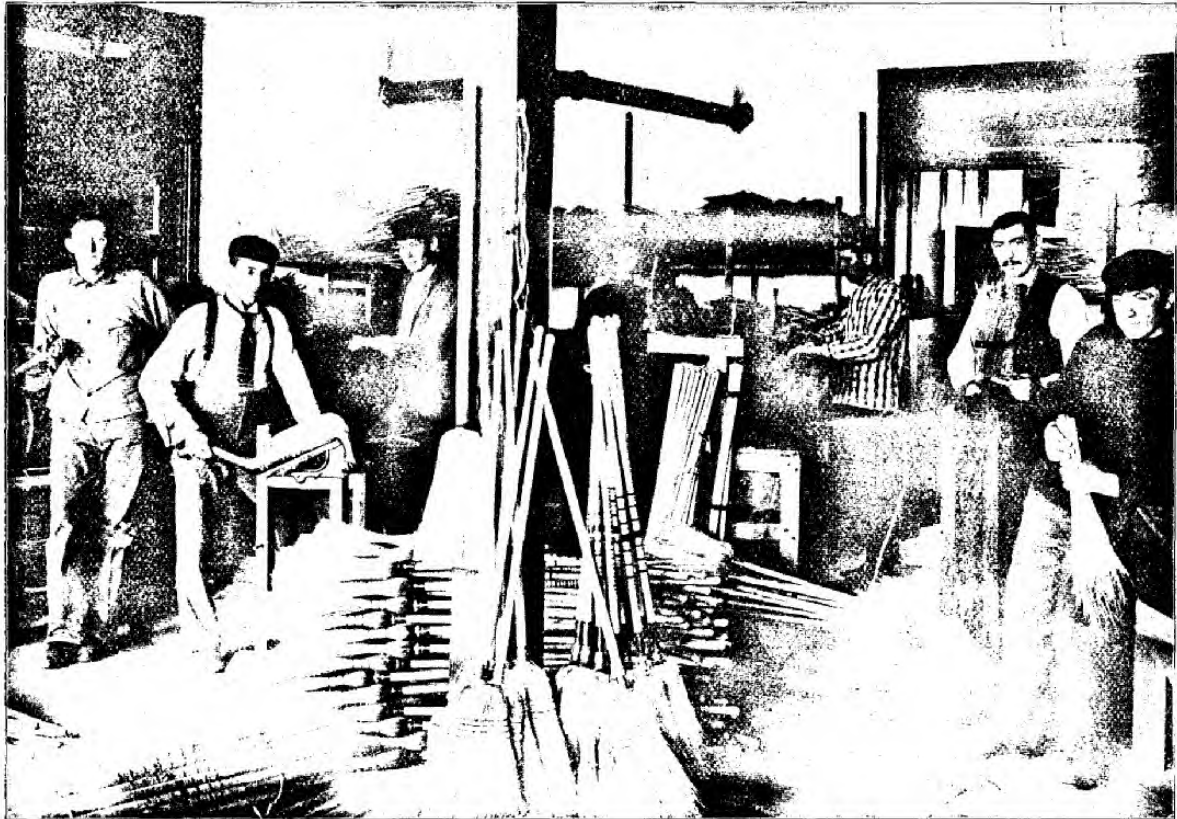
BROOM MAKING.

Broom-corn is cultivated very much the same as Indian corn or sugar-cane, its seed resembling that

of the latter. The ground is prepared as for Indian corn, and should be in good condition before planting. The seed is usually drilled rather thick in the rows, and when the plant first comes through the ground, it is somewhat tender; but with proper care and cultivation it soon makes rapid growth, so that by August it is well "headed," and ready for harvesting.

If the farmer has planted eighty acres or more of broom-corn, the harvest season will last from four to six weeks, and will be a very busy time, not only for the farmer, but for his wife as well; for usually there will be employed during most of the time from fifteen to twenty-five "hands." The work consists in cutting, thrashing, — taking off the seed, — and curing the brush. When everything is ready, the men go to the fields with well-sharpened knives (the ordinary shoe knife is generally used), and each one begins the work by first breaking together two rows the full length of the

cutting the brush from one row and placing it in piles on the table. After a sufficient amount has been cut, it is gathered up in wagons, and hauled to the place for thrashing and curing. In cutting, about six or eight inches of the stem is always left on for convenience in handling and working. The "thrashing-machine," is a very simple one, consisting of a cylinder about the size and appearance of a barrel, the surface of which is irregularly covered with strong iron or steel teeth about the size of a large spike or tenpenny nail: This cylinder, by the aid of horse-power or steam, is made to revolve very rapidly. Two men stand behind the cylinder, and hold upon it bunches of the "corn," when the seeds are jerked off with almost lightning-like rapidity. The brush is now taken into the sheds, where it is spread in many layers and permitted to dry, after which it is "bulked" and baled, when it is ready for market. Much depends upon the cultivation and careful-



THE BROOM FACTORY.

field. This is usually called "tabling;" from the fact that they then present the appearance of long tables nearly four feet in height, and so made that the brush or heads extend over either side. The cutter now returns, carefully but very quickly

ness in harvesting as to whether the brush will bring a good price; hence the farmer who has had no experience in its cultivation is liable to fail the first year, unless he employs some one who thoroughly understands the work.

The greatest broom-corn district in the world is in eastern Illinois, especially in Coles and Douglass counties, where thousands of acres are annually cultivated. Several years ago when broom-corn was worth from \$100 to \$150 per ton, it was considered a very paying crop, three acres producing about one ton of brush. But during the past few years the price has been very low, from \$40 to \$60. During the past few months, however, the price has rapidly advanced, and should the present prices keep up,—which will quite likely not be the case,—it will again become a very paying crop, as it can perhaps be successfully raised wherever Indian corn is grown.

While the making of brooms is not considered a difficult trade, nevertheless it requires careful work, and one must understand the business in order to make it a success. The brush is first sorted into three kinds, each kind for a different part of the broom: the inside, the covers, and the "hurl," or outside covers.

Before being made into the broom it is first soaked in water for a few minutes, then dipped into a coloring fluid, to give it as near as possible the fresh green tint of the natural brush when properly cured. After this it is usually "bleached" by being placed in a tight box in which sulphur is burned. This last process is supposed to toughen it, and otherwise make the broom more durable. The longest and best of the brush is selected for the covers, and is cut from the stem, and all is now ready to be made into the broom.

The machinery is quite simple, consisting of a broom winder, with which the brush is properly placed on the end of the broom handle, and firmly wrapped with wire provided for the purpose. From there it is taken to the broom press, which is little more than a clamp or vice for holding the broom in shape while it is being sewed. It is then placed on a broom clipper, and trimmed to the proper length, when it is labeled and ready for market.

Brooms are graded according to workmanship and material used, into about six different grades. A good workman can make several dozen brooms in a day, though usually in the large factories, each individual does only one kind of work, so that the broom goes through several hands before it is finished. There is a steady demand for good brooms, and probably they will never be made with less hand labor than now. For this reason, broom-making is one of the easiest and most profitable forms of labor for students who wish to learn to use their hands while engaged in disciplining the mind and character.

HOW BUSY EDITORS DO.

ONCE more the tale goes round of the author who sent a story to three journals, and had it returned by every one without having been read; he knew it, because he had pasted two of the leaves together. Very likely. We do not think of reading through a half or a quarter of the articles that are sent to us. It often does not take half a minute to discard what one knows he does n't want. It is an old saying that one does not need to eat a whole joint to learn whether it is tainted. It would be a revelation to some of these writers to see how fast an experienced and conscientious editor can, at times, go through a big pile of essays, stories, or poems. The title is often enough, and he would say, "We don't want an article on that subject." The next article begins with a page or two of commonplace introduction, and that is thrown aside in half a minute's inspection, without turning more than the first page. The next begins with a platitude—"We can't print that stuff." The first verse of this next poem has false meter, and is tossed aside. The next begins in schoolgirl style, with "dove" and "love;" it is not read through. Of the next the editor reads ten lines; it is simply a dull description of a stream in a forest—not wanted. The next poem begins in a fresh way, seems to be constructed according to the rules, is pretty good; it is put aside to see if other better poems will crowd it out. The next is a story; the first page is promising, but the second shows a coarse strain, and the reading stops there. Ten articles are decided upon, and with sufficient good judgment, in ten minutes; for a minute to a manuscript is often twice as much time as it needs. It does not take that long for a dealer to stick an iron skewer into a smoked ham, draw it out, and smell of it. Not one article in a dozen, perhaps, needs to be read through.—*The Independent*.

"By thy words thou shalt be justified, and by thy words thou shalt be condemned," is a principle that is true not only in reference to moral character, but in reference to practical scholarship as well. If one uses all his words correctly, the fact constitutes almost irrefutable evidence of his ability in all other lines; but if every now and then he makes a serious blunder in the proper use, spelling, or pronunciation of a word, he is marked as an unobserving, if not an ignorant, man. Mere words are not the most important thing in the world, but the ability to use them with absolute correctness presupposes a clear understanding of all the truths and facts which words express.

BIBLE PSYCHOLOGY.—VIII.

FRANK WILLIAM HOWE.

THE general purpose in the preceding article was to show that mind is organized spirit, just as body is organized matter. The mind exhibits itself in the three aspects of the Intellect, the Sensibilities, and the Will, these leading to outward expression as thought, word, and action. In a comprehensive sense the term "word" includes the other two; for there can be no thinking without words, and no voluntary act that is not also an expression of thought. In so far, then, as the "word" means *an expression of thought*, it sums up all the possible manifestations of mind.

That this is not only a philosophical but also a Scriptural conception, is evident in such passages as Gal. 5 : 14, where "one word" stands for a sentence of nine verbal syllables. And in John 1 : 1, 14, "the Word" signifies not only the thought of God verbally expressed, but as manifested also in the total life and action and emotional experience of Jesus of Nazareth. In the light of this conception, "the word" acquires a tremendous significance; which explains why our human words are of such importance in character-development that the apostle James declares (James. 3 : 2), "If any man offend not in word, the same is a perfect man."

The word, then, stands as an intermediate of mind and spirit; it is the medium through which unorganized spirit becomes individual mind, and also the medium by which this mind gets definite expression in human character and effluence [spirit] for good or evil.

Possibly this statement seems over-technical and too subtle for easy comprehension; but the student of psychology, in the Bible or out of the Bible, must school himself to close discrimination. The facts of this science can not be sorted as one would sort potatoes; and the facts of any science become classified only by the use of technical terms that have a concentrated meaning. "Science is knowledge in its most precise form of expression." So no one should be discouraged because science employs technical terms. No more should the carpenter be discouraged because he must learn to use particular tools in his work and reserve each to its own proper use. But the science and philosophy of the mind is capable of easy comprehension

when seen in concrete cases that come within the range of our own experience or observation. We have only to observe carefully, and then *record* these observations — photograph them — in definite terms that can be instantly employed for any subsequent use we may wish to make of them. If the photograph — the technical term — is not clear and distinct from all others, its use can only confuse.

I have said that the *word* is the medium or instrument through which spirit [influence] becomes organized as mind. That is to say, there is no mind until the *word* is formed in our consciousness. The truth of this each one may prove for himself by answering this question: Did *you* have a *mind* before you had any *word* (uttered or acted) by which to *express* your thoughts? The instant that a complete thought is shaped in a child's consciousness, his mind at that instant and to that extent becomes organized. A thought is a product of mental organization; and it is also a producer of mental organization.

Did you ever have a thought before you had a word for it? What kind of a thought was it? How could you prove that it was a thought? Our individual experience compels us to assent to the statement that *we think in words*. The word may be an unspellable exclamation, a groan, a whistled tune, a gesture, or a glance of the eye; but no definite expression of definite thought is possible without verbal representation. My thoughts become clear to me and possibly to others, only so far as I can clothe them in appropriate words. They may come faster than I can record them on paper or in oral utterance; but if these silently-articulated thoughts overflow the boundaries of my memory before I have caught them in the meshes of my record, then the overflow is lost for the moment. I may have a mental "itching," a tremulous yearning, a strong *impression*, of what I wished to say; but the *thought* is not recovered until the *words* return — or other words that answer the purpose.

Perhaps some have difficulty in verifying facts like these from introspection, or may doubt their validity, but can easily observe them in the second or third person. Fortunately for the purposes of this article, there appears in the last issue of the *Ladies' Home Journal* an interesting account of the mental history of Helen Keller, written by

Joseph Edgar Chamberlin. Liberty is taken to extract from it some statements of facts that have a direct bearing on the study of the present subject.

The case of Helen Keller is well known to the American public, and to psychologists in particular, as presenting many interesting evidences concerning the more occult processes of mental development. She lost her sight and hearing as the result of convulsions at the age of about eighteen months. She is now nearly nineteen years of age, and her general mental development is fully abreast, if not in advance, of that of the average young woman who has enjoyed full possession of all her senses. Yet up to the age of six years no progress had been made in her education.

At this period her characteristics were impulsive rather than rational. "She fought against everything she did not want, and for everything she wanted; her ordinary means of attracting attention to her wants was by more or less violent kicking." She developed a malevolent tendency toward her mother and other members of the family, and this manifestation of what seemed to be a particularly bad spirit led to the securing of a special teacher with the hope of improving her condition. This teacher was Miss Annie Mansfield Sullivan, from the Perkins Institution at South Boston. She began by endeavoring to teach the child by impressing on her hand the simple manual signs used in the instruction of the blind. One of the first efforts was to teach in this way the sign for "water." The child would repeat the signs under compulsion, but evidently with no conception of their meaning. It was a slow, unintelligent process, but the only one that could be used until the child should somehow grasp, and respond to, the significance of the effort. How this moment of comprehension came at last, after nearly a year of waiting, is best described in Mr. Chamberlin's own words:—

She was one day pumping water at the well — an operation which sometimes employed her restless but blind and uncomprehending, childish energies. Miss Sullivan was at her side as usual; she watched her day and night for the dawning of the instant of comprehension, dominating the rebellious child's every movement, bearing in upon her with an untiring determination the Word which was to unlock the world to her. Suddenly, as the water poured out at the spout, Helen stopped pumping, and a light came into her face which no one had ever seen there before. Then she thrust her hands into the water and eagerly grasped her teacher's hands, and over and over again made, rudely, the manual sign which signifies "water"! Her sudden eagerness showed that the Word had come. Miss Sullivan took the child in her arms, hugging her, kissing her, and patting her joyfully. Then Helen knelt on the

earth, slapped the ground with both her hands, rose, and seized Miss Sullivan's hands inquiringly. What was the sign for that? Miss Sullivan made it, and Helen repeated it excitedly. She seized the pump, and again clasped the teacher's hands. The sign for that? So she grasped from object to object, demanding to know the word for everything. She went to the house and plucked her treasured doll to pieces, presenting its eyes and everything else about it that she could detach for naming.

From this time everything was easy, and Helen's whole nature seemed to be changed. In a few weeks any one could communicate with her by means of the sign alphabet. Then came the raised print and writing with a pencil, and now she writes with ease on a typewriter, — using the German, Greek, and Roman alphabets, — and solves algebraic problems of this form —

$$x^5 + 2x^3 - 3x^2 + 2x + 1 = 0$$

carrying in her head all the steps of a solution which requires a half-page of fine print in the text-book merely to state it in regular order. — But for the narrative in full I must refer the reader to the excellent article cited in the May number of the *Ladies' Home Journal*.

The striking fact for the present purpose is found in noting that it was "the Word," — which Mr. Chamberlin rightfully dignifies with the capital letter — that opened the universe of light and love and joy to the clouded mind of Helen Keller. She is now of sufficient age and training to comprehend the psychological importance of her own experience; and she finds it impossible to recall a single *thought* which preceded the advent of the *word* as she stood silent at the pump, — at that well of the water of wisdom and knowledge. She has learned to read the speech of others by placing the tips of her fingers on the nostril, lips, and throat of the speaker, and is able to articulate clearly what she wishes to say to a listener; but she still uses the manual sign alphabet when "thinking" by herself, or when shaping or arranging her sentences before writing them out. The *word* is her only medium of thought; and having never learned that process of silent, inner, almost unconscious articulation which is common to persons who see and hear, she "thinks" in words represented by movement of her fingers and hands. In the language of Mr. Chamberlin, — "Back beyond her knowledge of *words*, Helen Keller has no *mind*; with the knowledge of the true use of one single word — the word 'water' — her conscious intelligence began." Questioned as to her recollections of that silent period of nearly seven years, she invariably answers: "I remember nothing; I have only vague, vague impressions!"

This is sufficient evidence upon the importance and necessity of the *word* as the mediating agent between the (spiritual) *impression* and the definite *thought* of organized *mind*. There is bound up in it the whole psychology of moral as well as mental development. The Christian teacher can not fail to see the vast significance of this subject. Helen Keller, blind, deaf, mute, rebellious, malevolent, uncomprehending,—and the same Helen Keller, awake, responsive, intelligent, eager, patient, and loving,—this is a parable of the change that comes in every human experience when the divine Word enters, illumines, and inspires.

MUSIC AND RELIGION.¹

DR. L. A. REED.

Music is something altogether too vast and beautiful to be expressed in language; it is love in search of a word; it is love seeking to reveal itself. "It is the child of prayer and the companion of religion." True music is the harmony, melody, and rhythm not alone of sound and tone, but also harmony, melody, and rhythm of the soul itself. Therefore, that which comes from a soul out of harmony with God is not, can not be, true music. Where sin is, there music is not. Sin is not rhythm, it is not melody, it is not harmony: it is vilest discord. And, hence, the farther we remove from sin and the effects of sin, the more closely do we approach to true music, where body and soul blend strangely together, making a true man truer, and a good man better.

Music speaks a universal language, understood wherever there are human minds, felt wherever there are human hearts. And like a rose-lipped shell, "it murmurs of the shores from whence it came—the soundings of the eternal sea." "It is a strange bird, singing the songs of another shore." "It is one of God's best gifts to man, the only art of heaven given to earth, the only art of earth we take to heaven." And it has "such wondrous perfection, such marvelous height of expression, a reach so far above the daily level, that only by transcending earthly capacity could we understand its burden." It is, one may truly say, not of earth or from earth, but of heaven and from heaven.

The first song of which we know is the song of the morning stars. When the foundations of the earth were laid, the universe sounded forth its joy in one glad anthem of praise, "when the morning stars sang together and all the sons of God shouted

for joy." That was chorus singing, for the morning stars sang *together*. It was trained singing under leadership, for they sang *together*. It was rhythm and melody, musical notes coming in time, for they sang *together*. It was harmony, chords striking with chords, for they sang *together*.

And again, when the foundations of the new creation were laid, when the Son of God was born, when the Child of glory lay cradled in a manger, the angels sang above the heaven-blessed plains of Bethlehem, "Glory to God in the highest; on earth peace, good-will toward men." That song was a song of adoration—"Glory to God in the highest." It was the message of peace—"On earth peace." It was a song of hope and promised good—"good-will to men." And so, I take it, our music should be the song of adoration, the song of peace, the music of good-will. But adoration, peace, and good-will, pertain to God, and are the essence of religion. And music, too, coming as it has from heaven, is never so true, so pure, so wholly music, as when it is joined with the thoughts of heaven—when it carries and expresses adoration, peace, and good-will.

Blessed are they who with instrument or voice can thus make heaven's music! But blessed also are they who, if not with instrument or voice, but in the heart, can make melody, as says the Word, "singing and making melody in your heart to the Lord." Such is truest melody, it is truest singing—singing and making melody in the heart. The song and melody of the bare voice and instrument may reach the ear and the brain, but the song and melody in the heart and from the heart,—that, and that only, can reach the heart.

Music and religion! Music is of the other life, and it is not truly music unless it be the exponent of that life. How often are we "made to feel with a shivering delight, that from an earthly harp are stricken notes which can not have been unfamiliar to the angels." As Wagner says, what "music expresses is eternal and ideal." "O music," cries Richter, "thou who bringest the receding waves of eternity nearer to the weary heart of man, as he stands upon the shore, and longs to cross over,—art thou the evening breeze of this life, or the morning air of the future?"

The question is not left unanswered. When we read of the glad songs of the life beyond this life, of "the voice of many waters, as the voice of a great thunder, and the voice of harpers, harping with their harps," singing the grand, new song, we know that music is not only the vespers of this life, but the matins of the life to come.

¹ A five-minute address given at a recent song service in the Tabernacle, Battle Creek, Mich.

Melody was sent from heaven to cheer the soul when tried with human strife, and it will be ours in heaven with which to sound the praises, and sing the joys that await us there. And if God affords sinful men such music on earth, what music has he not provided for his saints in heaven?

Let us sing now with cherubim and seraphim the songs of adoration, peace, and good-will, that we may sing anew yonder in the great concert halls of heaven, the praises of him who has "loved us, and washed us from our sins in his own blood, and hath made us kings and priests unto God and his Father;" and "to him be glory and dominion for ever and ever. Amen."

SCIENCE STUDIES.—VIII.

OTHO C. GODSMARK, M. D.

IS THE SUN HOT?

From a careful consideration of the writings of our latest investigators in the field of physics, we find such a difference of opinion, that one can scarcely refrain from inquiring as to the general correctness of the whole theory. Since the days of Swedenborg, who is credited with being the father of the nebular hypothesis, the theory of the intensely heated condition of the sun has received no serious opposition until within a very recent period. The presentation of various papers before some of the leading academies of science, both of this country and Europe, has, within the past two or three years, stirred up some thoughtful minds. Some scientists have so far departed from the orthodox conception of the molten, heated condition of the sun, as to hold that its real body is not hot at all; but that it is a cold, porous mass from which gushes vast quantities of inflammable gas, and that it is the combustion of this gas which produces the phenomena of solar light and heat. This we believe to be much nearer the truth than is the nebular hypothesis, as by it the phenomena of the dark umbra of the sun spot is more readily understood. Yet this theory is open to many serious objections; for while the body of the sun itself might be cold, and our heat and light come to us as the natural result of the gaseous combustion taking place some distance from its surface, yet we are left to grapple with many of the same knotty problems that confronted us before.

Instead of considering the sun as either a molten mass of heated matter, according to the nebular hypothesis, or even as a cold body shooting forth in all directions an immense volume of ignited gas,

let us consider it as a great electric dynamo giving out positive electricity. This view is receiving, at the present, many ardent advocates, and we are pleased to know that already some text-books for school use have been prepared along this line. Believing in the inhabitable of the other worlds, that this earth and the different members of our system were all created at the same time, that man was *created*, not "evolved," that the planets of our system will be inhabited throughout eternity and not become forever a frozen, desolate waste, and that this earth was once devastated by a flood and not covered by what is commonly known as the glacial period,—why not, then, look at the facts as they are, in a light that is at once harmonious and consistent? The study of nature is the study of God, and the book of nature is just as harmonious and consistent as is the other Book God has given us,—the Bible.

Suppose the sun to be a body giving forth immense volumes of positive electricity. This electricity traverses inter-stellar space and reaches the atmospheres of the different planets as electricity. Its temperature may be, for aught we know, that which is usually attributed to space; viz.,—250° F. The resistance which these electric rays meet in passing through the atmospheres of the different planets begins that pulling-down process with which these studies have dealt so much in the past. Without reference to these back lessons, some may consider the present study somewhat obscure, and will not derive all they should from the future lessons. If, as was shown in the February number of the EDUCATOR, electricity can, by the simple pulling-down or slowing-up process caused by the proper kind of resistance, have a portion of its rays converted into the next lower manifestation of vibration; viz., the X-ray, and this by still meeting with the proper kind of resistance can again be lowered into white light, then the planets can all receive a suitable amount of light for their needs, according to the depth, density, and resistance of their respective atmospheres.

In our study of light in the December and January numbers of the EDUCATOR, we learned that light is subject to this same pulling-down or slowing-up process as is electricity, and that by being thus resisted, it produces the varied manifestations of light in its different colors. In the November number we learned that heat is but a lower form of vibration than light, and that light is easily changed to heat. Space does not here permit us to present even a few of the many familiar illustrations showing that solar light, when properly re-

sisted, has many of its rays slowed down or changed to heat.

This being true, how simple the problem of heat and light as manifested on the different planets, be their distance from the sun whatever it may. The electric rays coming from the sun reach the outer or thinner portions of the planetary atmosphere and immediately the less vigorous of these electric rays are slowed down by the resistance of the atmosphere and become light rays. These light rays, in connection with those of the electric rays that have so far resisted the pulling-down influence of the lighter portions of the atmosphere, speed on toward the planet, passing through its enveloping atmosphere which becomes continually denser as the rays approach the body of the planet itself. As the two companion rays, electricity and light, are continually meeting with increased resistance from the increasing density and dust of the lower strata of atmosphere, more and more of the electric rays become changed into rays of light; and of those rays that first weakened and were slowed down to rays of light as they entered the outer strata of atmosphere many are still lowered to the range of heat. The more dense the atmosphere, the more resistance is offered to the rays passing through it, and the greater the change from electricity to light, and from light to heat. This explains why the *light* and *heat* are both so much more intense down in the low valley than they are on the snow-capped mountain top some miles above. It also explains why the *electrical* discharges and display are so much more frequent and severe upon the mountain peak than in the valley below.

Suppose two planets equally distant from the sun, the one having a dense, deep atmosphere, while that of the other is thin and light. The surface of the former will be hot and well lighted, while the second would possess neither of these conditions in so full a degree. Now it is a fact that the more distant planets from the sun have much heavier and more dense atmospheres than those nearer the sun, and we believe that by this means the amount of light and heat is proportioned to the several worlds in such a degree that an inhabitant from one world might visit another world and not find the conditions so wonderfully different as our world-wise scientists would try to have us believe. The planets Uranus and Neptune are so far distant from the sun as to be only frozen, desolate wastes, if they are to depend on the sun for their light and heat in the manner generally ascribed to them; yet we believe that they are quite

comfortably lighted and warmed by the electric rays being converted into light and heat in passing through their deep, dense atmospheres; and Mercury, though so near the sun as to be far more than boiling hot, if the old view is correct, we believe to be comfortably cool, as the thin, light blanket of atmosphere with which the Creator has seen fit to enshroud it would offer so little resistance to the flood of electric rays that but comparatively few of them would be changed into light and heat.

We have learned in preceding lessons that electricity is one of the highest known manifestations of vibration, and that by its meeting with the proper kind of resistance it is lowered into a field occupied by the X-ray; that this in turn is easily lowered into the field of light; that light is likewise easily slowed down so as to become heat; and now the question may arise, can these rays continue to be slowed down so as to become sound? We do not know; but we believe they can, and further believe that this is happening all the time. For example: it has been known for some time that by lowering a sensitive plate, arranged on the same principle as the tin-foil on the receiving cylinder of a phonograph, to a given depth in the sea, sound vibrations are recorded; and science has been at a loss to explain what should cause this sound to be present at a certain distance from the surface of the water; but we believe the principle stated above entirely explains the phenomenon.

Will teachers and students kindly consider the views herein presented in the light of the preceding lessons, and see if there does not exist in them a harmony not known before? Each future lesson will take up some one of the various manifestations of God's creative power, considered in reference to the principles already studied, the appreciation of which can now be better understood.

MEMORIZING is a profitable exercise. Our children and youth read too many things which are read to be forgotten. All such reading weakens the mind. Memorizing strengthens the mind, and impresses upon it, not only the thought, but the form of the language used in its expression. The child who learns a few verses from the Bible each day, making them the basis of a lesson in composition, spelling, punctuation, reading, language, and spiritual truth, is acquiring that which will be of real practical value.—*J. E. Tenney, in Training School Advocate.*

CHRISTIAN EDUCATION VERSUS HEREDITY.

MRS. S. M. I. HENRY.

NOWHERE is the teaching of science, so-called, more arbitrary in these days than in matters of heredity; and many fathers and mothers have been reduced to a state bordering on despair as they have realized what they had in their ignorance and wilfulness given of evil as a legacy to their children, forgetting what God in his wisdom and self-sacrifice has upon his side of the family provided for them out of the "all things" which are laid up in store for children's children to the end of time.

"What can I expect?" exclaims some father or mother. "What can I hope for my children, considering my own past and that of my ancestors?" and "What can education be depended upon to accomplish?" is one of the live questions of our day.

One father said, "I have put away every bad habit, but I am afraid I did not do it soon enough to be of any use in making character in my children." If character depended on anything short of "Christian education," if it was a result of anything but genuine "works" of righteousness, such as only a living personal faith can produce; and if victory over an evil heredity did not depend on an individual and intelligent warfare against sin, there might be occasion for these doubts and anxieties. Concerning the individual nature of this conflict and victory, the Lord has declared, himself with a clearness that admits of no twist in interpretation. In the language of indignant reproof he has answered all those surmisings in which he is practically charged with the most foolish injustice in his dealings with the generations of men.

"What mean ye, that ye use this proverb concerning the land of Israel, saying, The fathers have eaten sour grapes, and the children's teeth are set on edge? As I live, saith the Lord God, ye shall not have occasion any more to use this proverb in Israel. Behold, all souls are mine; as the soul of the father, so also the soul of the son is mine: the soul that sinneth it shall die. But if a man be just, and do that which is lawful and right, . . . hath walked in my statutes, and hath kept my judgments, to deal truly; he is just, he shall surely live, saith the Lord God. If he beget a son that is a robber . . . shall he then live? he

shall not live: he hath done all these abominations; he shall surely die; his blood shall be upon him. . . . If he beget a son, that seeth all his father's sins which he hath done, and considereth, and doeth not such like, . . . hath walked in my statutes; he shall not die for the iniquity of his father, he shall surely live. . . . The son shall not bear the iniquity of the father, neither shall the father bear the iniquity of the son."

It is upon this principle of equity, as applied to the dealings of God, even in the operation of a law so apparently natural and arbitrary as heredity, that Christian education depends for success in its work of turning back upon itself the dark tide of a corrupted nature so as to leave the channel open for the free flowing of the waters of life.

In this declaration of God there is a thrilling note of courage for those parents who in the first fearful awakening to truth are looking back upon their own past, down into their own hearts, and out of a trembling conviction of infirmity are filled with forebodings concerning the future of their children; and in the system of Christian education as it is opened up in the Word of God there is not only hope, but assurance.

Some parents are saying, "I would rather have my children grow up in ignorance than in sin." But ignorance *is* sin. Through knowledge alone is salvation. Ignorance is the fruitful soil out of which every evil thing grows indigenously. Any one who has lived long on the prairies of the West can tell you just what wild plants will grow if you keep the fires off, turn the sod with a plow, and leave it fallow; and observation, as well as experience, has taught us what will grow in the nature that is left altogether untaught and untrained.

Evil imaginings, superstitions of all sorts, are indigenously in fallen man, and only by the most careful Christian culture can we avoid all that has been feared from the operation of the laws of heredity. This law is still in full force in every creature. It will work destruction unless the correlated law of Christian education shall meet it and turn the fallow ground into a field fruitful in a carefully grown harvest of truth and virtue.

This can be done,—God's word for it; but it will not *do itself*. To accomplish it there must be the most earnest, patient co-operation with God upon the part of parents and conscientiously se-

lected teachers. Nothing must be allowed to stand in the way of this true education of the children in the things of Christ and of the Holy Spirit.

The question is often asked, What is Christian education? and how does it differ from the ordinary work of the school? Does it not consist in training the motive so that the pupil shall study all and anything for the glory of God?

It certainly consists in all of this, and in much more than is generally understood by such a definition,—it consists in teaching the principles of righteousness and their practical application to all things, both good and bad.

Christian education might be defined as the application of principle to the entire man, and to everything with which he must have any dealings. And since the Bible is the one text-book on principle, it follows that it must be the basis of all true education.

The office of education is to overcome an undesirable heredity, which has made itself felt in every nerve, muscle, organ, and appetite of the body, so that they can not do the work for which they were designed in the beginning. Christian education is expected to take hold of every faculty of mind and body, and bring them up into health in spite of any inherited tendency to disease.

The gospel is simply a system of education vitalized with divine power, by which the heredity of sin, with all that it entails, is to be overcome, uprooted, and utterly destroyed out of the life. It is here that the two forces, heredity and education, meet in the last great conflict in every nature; and victory through Christ consists in such an adjustment of their co-relations that the power of heredity shall continually decrease, while that of Christ shall as continually increase, until the heavenly shall have supplanted the earthly, and mortality, with every evil taint, shall have been "swallowed up" of immortality.

The power of heredity is not to be defied with impunity, and can only be met with that kind of recognition which is involved in a true appreciation of it, and with courage born of faith by which to take hold of and safely dispose of any legacy which it would force upon any child of God.

SCHOOL SURROUNDINGS.—III.¹

AFTER the school ground has been properly platted and bordered with shade-trees, attention should be given to ornamenting with shrubs and flower-

ing plants; but nothing is more attractive than a strong-growing green sod on the vacant areas.

"In many cases the school yard is already level or well graded and has a good sod, and it is not necessary to plow it and reseed it. It should be said that the sod on old lawns can be renewed without plowing it up. In the bare or thin places, scratch up the ground with an iron-toothed rake, apply a little fertilizer, and sow more seed. Weedy lawns are those in which the sod is poor. It may be necessary to pull out the weeds; but after they are out, the land should be quickly covered with sod or they will come in again. Annual weeds, as pigweeds, ragweed, can usually be crowded out by merely securing a heavier sod. A little clover seed will often be a good addition, for it supplies nitrogen and has an excellent mechanical effect on the soil.

"The ideal time to prepare the land is in the fall, before the heavy rains come. Then sow in the fall, and again in early spring on a late snow. However, the work may be done in spring, but the danger is that it will be put off so long that the young grass will not become established before the dry, hot weather comes.

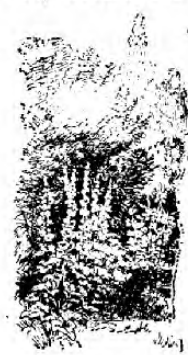


FIG. 1

"The only outlay of money required for the entire improvement is for grass seed. The best lawn grass for New York is June-grass or blue-grass. Seedsmen know it as *Poa pratensis*. It weighs but fourteen pounds to the bushel. Not less than three bushels should be sown to the acre. We want many very small stems of grass, not a few large ones; for we are making a lawn, not a meadow.

"Do not sow grain with the grass seed. The June-grass grows slowly at first, however, and therefore it is a good plan to sow timothy with it, at the rate of two or three quarts to the acre. The timothy comes up quickly and makes a green; and the June-grass will crowd it out in a year or two. If the land is hard and inclined to be too dry, some kind of clover will greatly assist the June-grass. Red clover is too large and coarse for the lawn. Crimson clover is excellent, for it is an annual, and it does not become unsightly in the lawn. White clover is perhaps best, since it not only helps the grass but looks well in the sod. One or two pounds of seed is generally sufficient for an acre.

¹The quotations and illustrations in this, as in the two preceding articles, are borrowed from a bulletin, "Hints on Rural School Grounds," issued by the Cornell University.

"At first the weeds will come up. Do not pull them. Mow the lawn as soon as there is any growth large enough to mow. Of course, the lawn mower is best, but there is no use of recommending it for rural school yards. Then use the ordinary field mower. When the sod is estab-

lished, mowing the yard three or four times a year will be sufficient. And here is another advantage of the open-centered yard which I have recommended, — it is easily mown."

In the selection of shrubs

and trees, only the most common should be planted, as they will be most certain to live and thrive. The most ordinary shrubs and bushes when carefully placed in a school ground will give it a beauty that would delight the eye and heart of a city-bred boy or girl. Willows, wick-hazel, dogwood, sweetbriar, thorn-apple, elders, sumac, and many others may be found in almost any rural locality. Others can easily be added from the farmer's garden and orchard.

Along the fences and the walls of outbuildings running vines may be used to excellent advantage. "Against these heavy borders and in the angles about the building, many kinds of flowering plants can be grown. The flowers are much more easily cared for in such positions than they are in the middle of the lawn, and they also show off better. Notice how striking the hollyhocks are in Figure 1. They have a background. Even a clump of weeds looks well when it is in the right place." (See Fig. 2.)

"Only those flowers should be used which are very easy to grow and which have the habit of taking care of themselves. They should also be such as bloom in spring or fall, when the school is in session. Perennial plants — those which live from year to year — are excellent. Of these, day lilies, bleeding hearts, pinks, bluebells, hollyhocks, perennial phlox and hibiscus, are always useful. Nothing is better than the common wild asters and goldenrods. They will grow almost anywhere

and they improve when grown in rich ground and given plenty of room; and they bloom in the fall.

"Annual flowers may be grown along the borders, out of the way of the playgrounds. China asters, petunias and California poppies are very attractive, and they are easy to grow. They bloom in the fall. Phlox, sweet peas, Alyssum, and many others are also useful.

"While the main planting should be made up of common trees and shrubs, a rare or strange plant may be introduced now and then from the nurseries, if there is any money with which to buy such things. Plant it at some conspicuous point just in front of the border, where it will show off well, be out of the way, and have some relation to the rest of the planting. Two or three purple-leaved or variegated-leaved bushes will add much spirit and verve to the place; but many of them make the place look fussy and overdone."

Who can estimate the ultimate influence of attractive school surroundings upon the taste, disposition, and character of pupils in later life? And the outlay in time and effort to cultivate these beneficent influences is insignificant in comparison with the results sought. It is easy to make a "living picture" like Figure 2 that will abide forever in memory of a happy childhood. Even a sprig of wild flowers may brighten and cheer the heart for days. "There is no leaf of the forest, or lowly blade of grass, but has its ministry."

The heart of child and man has been made responsive to the sweet influences of Nature and learns to look through Nature up to Nature's God. Surround our children with an environment that is beautifying and uplifting, and we have furnished them with the strongest support and incentive to the highest mental and moral development.

No daintie flowre or herbe that growes on
ground;

No arborett with painted blossoms
drest

And smelling sweete, but
there it might be
found

To bud out faire, and
throw her sweete
smils al
around:



FIG. 2.



SUGGESTED SCHOOL REFORMS.

E. B. MILLER.

WHEN our educational system comes to be so arranged that students once begin in the right way, doing original work on principles, instead of second-hand work on man-made problems, they will soon advance more rapidly, and lay hold of new thoughts with great avidity, and in the end have a more comprehensive knowledge than the book-made students.

We have in many colleges, by actual count, made to order and laid up for next year's use, more than twelve thousand examples and problems in our books on mathematics alone, and nobody knows how many more there are in all the other text-books used. The time will come when one fifth of that number, made by the pupil himself and worked out by his own brain, will accomplish far more satisfactory results than are now being accomplished. And what is true of this branch of learning is equally true of many others.

For example, take two young children; you wish to teach them to use their mother tongue correctly and fluently. — One you give a text-book and send to school to learn the parts of speech, to parse and analyze, and to appreciate the best thoughts of the best writers. The other you place in a family whose members use good language in all their conversation. Everybody knows that at the end of the trial, the child who has heard his language spoken correctly will use much better language than the one who has simply been learning from a book. He may not know the answers to so many definitions, but he will know how to talk. If all the teachers in our schools would use correct language, and would require their pupils to do the same, more would be accomplished in one year in learning good English than is now accomplished in five years by the constant use of grammars and rhetorics.

In the study of nature, also, a vast amount of harm has been done by keeping students continually reading what men have said about it. When a young man is kept constantly busy studying books, how can he become a keen observer and an original thinker? When we leave the wonderful works of God that are all about us, and shut ourselves up to feed on what man has said about these works, we may rest assured that the process will be disastrous to the mind, and, it may be, to the soul as well.

The brightest scholar by far for her age that has been within the walls of one college this year, is a little girl who has never learned a lesson from any

book. For originality of thought, quickness of perception, clearness of logic, and aptness of speech, she has no equal. But if this child's mother ever places this little two-year-old in school to get knowledge from books, it will not be long before the child will be as dull as the rest of us. There is something about the process of book-learning that tends to deaden the mind instead of waking it up. Mrs. Palmer tells of the little boy who came home and told his mother that there was one thing at school that greatly troubled him, and that was those dreadful questions: "If John has two red apples, and Charles has two red apples, how many apples have they both?" "Well," said his mother, "you know perfectly well that two and two make four." "O yes," he said, "of course I know that two and two make four, but it's the process that wears me out." And Dr. Parker tells of a bright little girl who began her recitation by saying, "I think." "We don't want any thinking here," said her teacher, "tell us what the book says." And we have kept our young people so busy telling what the book says that many of them can not even tell how the new moon looks.

Not many months ago the president of a certain college asked one hundred and twenty-six of his pupils a list of questions which had been prepared for them. The average age of the pupils was seventeen or eighteen years. There were nearly as many ladies as gentlemen. All were good book-students. The answers were to be written on paper. Some seemed rather unwilling to leave their books long enough to answer the questions, and so were hardly ready for the first one given, which was this: $5 + 3 \times 2 + 4 - 10 \times 3 + 20 \div 5 + 6 + 4 \times 5 + 15$ equals what number? Seventy-three out of one hundred and twenty-six answered correctly. Thirty-three gave no answer, and desired another trial, as they did not understand exactly what was wanted of them. All were ready for the next question, which was, "A man bought wheat at fifty cents a bushel, and sold it at one dollar a bushel; what per cent. did he make?" Forty-one, less than one third of the pupils, gave the correct answer. One young man who expected soon to be graduated said the gain would be one-half per cent., and one young lady said, two hundred per cent. The process was what wore them out.

Other questions were asked in science and language, with equally absurd answers. The students had studied books rather than things. The remedy is obvious; study real things, principles, and reasons, rather than mere mechanical processes. Then study the process as a means to an end.

SCHOOL ORGANIZATION.—III.

THERE was left from the preceding article the consideration of what has been called the "Graded Plan" and the "Flexible Plan." Most of the city school systems in this country are based on a four-year division of studies,—four years in the primary and intermediate departments, four years in the grammar school, and four years in the high school, preparatory to four years in the college or university. In many cities these yearly grades are subdivided into two each, variously named as the "A 10," "B 10"; the "10-1," "10-2"; or the "high 10," and "low 10." The half-yearly division is a decided advantage in the classification of incoming students, and in their more rapid promotion; but it requires a larger teaching force, unless the classes are so large that some division must necessarily be made for recitation purposes. Grades less than a half-year apart are not attempted, and so good an authority as Emerson E. White says that he has never known a successful attempt to grade any country school with less than a year interval between the grades.

There are many difficulties in carrying out even this plan where the grades are full, and only one teacher in the school. A country school of only eight grades, with an average of only four branches in each, requires thirty-two recitations in six hours,—less than twelve minutes for each,—which is far from being sufficient. Some modification of the regular graded plan is therefore necessary in securing the greatest economy of effort for teacher and student. What would theoretically appear to be "system and order must often be sacrificed to the needs of the pupils and the limitations of the teacher."

To meet these conditions in the one-teacher school, Mr. White proposes a "Three-Grade Solution," which is worth the study of our church-school teachers, because it is based on the *order of mental development* in children. Many young teachers—and older ones who ought to know better—make the mistake of supposing that children can be treated by the same methods that hold with adults, that (for example) children may be lectured in classes just as the oldest students are. But there are definite psychical periods of growth that can not be disregarded without injury that may be lasting.

The earliest of these may be called the "*objective period*," generally lasting from five to eight years of age. During this stage the child's teaching should be done mostly through objects, and his skill in primary reading, writing, number, and lan-

guage, must be acquired by imitation. He is not prepared for complex reasoning, for much study of cause and effect, nor for profound moralizing. He lives in *things*, and can learn them faster and more permanently now than at any later time. The only book needed is a reader and the open page of nature. The simple stories of the Bible are most excellent; but there is danger of cultivating a too *material* conception of God and spiritual things.

The next period, from three to four years in length, is pre-eminently the "*fact and skill period*." "In this period pupils pass increasingly from concrete facts to their simpler generalizations, from processes to rules, and from the known to the related unknown by either imagination or thought; and skill in the several school arts is increased by practise under guidance." This is the time—not before—for learning the multiplication tables, having previously worked them out concretely. Correct habits of speaking, reading, carriage, and general conduct, should be firmly established. Observation and spelling should be made prominent. The instruction should still be largely oral. The simpler facts of physiology should be thoroughly grounded. The only new books needed are a beginner's arithmetic and, later, a geography.

The next three or four years constitute what may be called the advanced or "*reflective period*." "The pupils have now sufficient skill in interpreting written or printed language, and sufficient thought-power to study, with proper instruction, a complete arithmetic, an advanced geography, English grammar, United States history, physiology, and the elements of natural science." And this range of studies is sufficiently advanced to cover the possibilities in the ordinary country church school.

These three periods constitute a natural basis for the classification of a church school, allowing sufficient flexibility for the needs of each pupil without making each a class by himself. "It is not necessary to divide the course into year and term sections with a prescribed order of subjects and parts of subjects for each term, as is often done in graded courses for cities. There should be a general order or sequence in the course, but the teacher should be left free to form classes with varying intervals between them, and the progress of each class should not be fixed by a time schedule—as is sometimes done in city schools with many teachers. To reduce the number of classes in a given grade, it may be necessary to take up parts of subjects in a different order from that laid down in the course of study, and no two classes may make equal progress."

The essential requirement in the classification of any school is that the regular work of each class *must be completed* as a condition of promotion to the next class. "In a one-teacher school, pupils may and should be permitted to pass a grade line in any branch when they are prepared to do the work of the next higher grade. In practise it will be found that most pupils can with advantage cross the grade line in all branches at the same time, but this result should not be forced."

These general principles should be helpful in arranging the plan of class work in our church schools. The conditions are so varying that it would be almost impossible now to formulate a daily program that would be practicable in all the schools. The great thing to be desired is the establishment of something like a uniform course of study, with suitable text-books for the use of teacher and students. This would give an impetus to the church-school work that would establish it upon a solid foundation, without which it can never be sure of having the continued support and co-operation of its patrons.

[The EDUCATOR would be pleased to receive questions and suggestions from the teachers in whose behalf this department is conducted. Send us a daily program of your school work.]

SOME "DON'TS" FOR PUBLIC SPEAKERS.—II

Don't say, "I am going to tell you this," unless you are actually *going* somewhere before telling it. The fault is perhaps more clearly seen in this: "I am going to go to-morrow." Reserve the "going" for the real locomotion. Say instead, "I shall tell you," or, "I shall go to-morrow." It would, of course, be proper to say, "I am going to see him," if he were in another town; but not best to say, "We are going to see harder times in the future."

Don't say, "We must make a decisive move." To "make a move" is too suggestive of the slang expression "Get a move," etc. We move, but do not *make* "a move," though we may make a movement. We pray but we do not *make* a prayer; and it is not even in good form to say, "I make a motion." But no one can be reproved for saying, "We must move decisively," or, "A decisive movement is required."

Don't say, "Please, omit the third verse of this hymn," when you *mean* the third stanza. It would be a very awkward and difficult thing for a congregation to omit the third verse and yet sing the first, second, and all the remaining verses of a stanza. A *verse* is, of course, only *one line* of a stanza, while the stanza itself is a group of verses

corresponding to the prose *paragraph*. Strictly speaking, the "verses" of Scripture are simply parts of a paragraph, and are so indicated in the Revised Version. But probably, the word *verse* will continue to be used in its special Biblical sense even by those who are careful not to use it improperly when speaking of poetry.

Don't slam your Bible down on the pulpit; nor snatch it up, read a text a yard or two away, and then toss the book back on the desk. Don't pound the Bible, nor the pulpit, till the people wonder how long it will hold together. It always pays a preacher to treat the Bible reverently in public, because of what it *represents*, if not for what it *is*. Persons of delicate sensibility may easily lose the benefit of what is actually an excellent sermon, if the minister handles the Bible as a carpenter would not an old wooden plane. We can not think of Jesus pounding or throwing the Holy Scriptures.

Don't say, "Means is greatly needed for carrying on this work." It is well known that "means" *means money*. Then why not say "money"? For years and years "means" has been employed as a euphemism for money, under the misapprehension that it is a milder, less objectionable expression than to say "money" outright. But the people have heard "means" reiterated so often that they are tired of the word; they would much rather hear a plain, direct call for *money*. Try it and see.

Don't say, "I don't know if I can make it plain." *If* you can make it plain, that is very good evidence that you *do* know. If you wish to make it plain that you are uncertain of your ability, just say, "I don't know *whether* I can make it plain" (without emphasizing the "whether"). But it is usually best not to make such admissions at all. If a thought is not clear to your own mind, you can scarcely hope to make it clear to others — especially if you warn them of your own uncertainty beforehand.

Don't say, "We do not realize the importance of this," when you *mean*, "We do not comprehend (or appreciate) the importance of this." To *realize* is not to make clear, but to make *real*. We *realize* our hopes when we *have* the things hoped for. We *comprehend* a subject when we take it within the grasp of our understanding. Many suppose that we "appreciate" only what is *good*; but alas! many have appreciated evil. To *appreciate* anything is to *estimate* justly the significance or attractions of it because of experience with it or with its like. Too often we do not appreciate the importance of such distinctions in our use of words.

Conducted by A. B. OLSEN, M. D., M. S.

HUMAN PHYSIOLOGY.

DIGESTION.—THE ORGANS OF DIGESTION.

THE digestive organs consist of the alimentary canal and the glands connected with it. This canal is a flexible muscular tube of varying thickness, and about twenty-six feet in length. It consists of the gullet, or esophagus, stomach, small and large intestine, and rectum. The glands are five in number, the liver, pancreas, and the three salivary glands,—the latter being paired, and known respectively as the parotid, submaxillary, and sublingual glands.

On entering the mouth, the food comes in contact with the saliva, the digestive fluid produced by the salivary glands. After being ground by the teeth and thoroughly incorporated with the saliva, it is swallowed, and passing down the gullet, enters the stomach. The opening into the esophagus is called the pharynx. See Fig. 26. The latter communicates with the larynx, or voice-box, through a small opening called the glottis. This is protected by a lid or door, the epiglottis, which prevents food from passing into the lungs and setting up a serious or even fatal inflammation. The esophagus is a flaccid, muscular tube about nine inches long, which opens into the stomach through the cardiac orifice. It is lined by many layers of delicate flattened epithelial cells. Small mucous glands are also found in its walls. Their viscid, semifluid secretion serves as a lubricant for the passage of the food. Neither food nor water falls

through the esophagus, but is slowly passed along the canal by a peristaltic muscular movement. When a horse drinks the water flows up hill. A man can drink even when hanging from his feet.

In the stomach the food meets a second digestive fluid called the gastric or stomach juice. It is secreted by numberless minute tubular glands situated in the wall of the stomach. This organ is a

pear-shaped muscular bag, and is indeed nothing more than a dilatation or widening of the alimentary canal. The stomach is lined internally by a single layer of very delicate column-shaped epithelial cells. Scattered among these are some goblet cells which secrete mucus. It lies just below the heart and directly behind the lower ribs of the left side. Its normal capacity is two to four pints. Here the food remains about three hours, more or less, according to its digestibility, and undergoes a churning process which changes it into a semi-fluid, acid substance called chyme. Now it is passed through the pylorus into the small intestine, where the process of digestion is completed, and the nutritious part of the food is absorbed. Two glands, the liver and pancreas, empty their secretions by a common

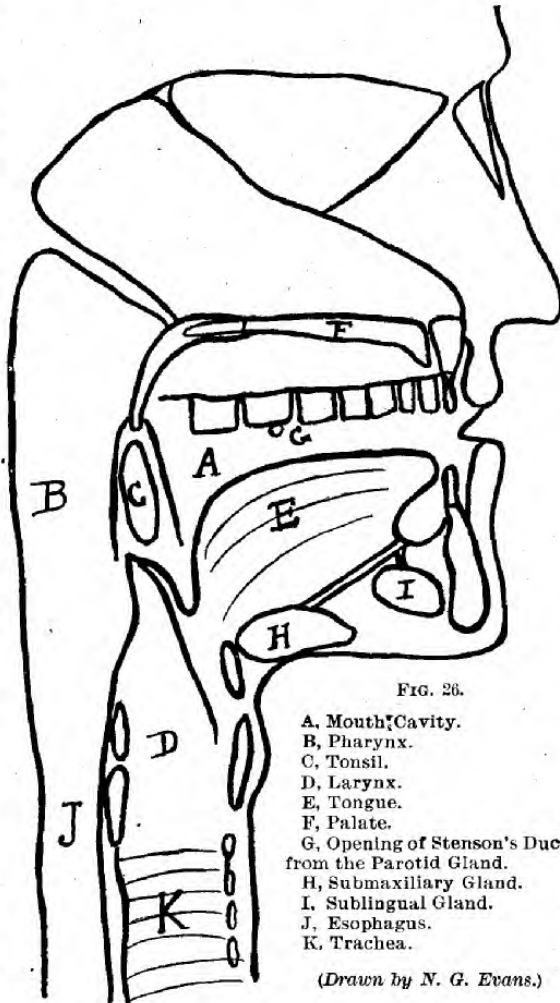


FIG. 26.

- A. Mouth Cavity.
- B. Pharynx.
- C. Tonsil.
- D. Larynx.
- E. Tongue.
- F. Palate.
- G. Opening of Stenson's Duct, from the Parotid Gland.
- H. Submaxillary Gland.
- I. Sublingual Gland.
- J. Esophagus.
- K. Trachea.

(Drawn by N. G. Evans.)

duct into the upper portion of the small intestine only about three inches from the outlet of the stomach.

The liver is the largest gland in the body, and weighs about three and one-half pounds. In it bile is formed, which is stored up in the gall-bladder, and emptied into the intestine during digestion. The gland lies under the right lung

coming up as high as the sixth rib. The pancreas, called by German physiologists the abdominal salivary gland, on account of its structural similarity to the parotid gland, is much smaller, weighing only about three ounces. It lies behind the stomach, and is club-shaped, with the head against the beginning of the small intestine. Its secretion is poured directly into the intestinal canal.

The small intestine is an irregular, convoluted muscular tube about twenty feet long. It is held in place by a thin connective tissue band, the mesentery, which is attached to the posterior wall of the abdominal cavity. Inside are numerous transverse crescentic folds which are known as the connivent valves or *valvulae conniventes*. Innumerable slender minute tubular glands line the intestinal tract throughout and produce a secretion which lubricates the canal and also assists in digestion. Like the stomach, the canal is lined by columnar epithelium, but the mucous cells are much more abundant especially in the large intestine.

The opening into the large intestine or colon is guarded by a valve which permits the contents to pass in one direction only. The colon is about five feet in length including the rectum.

SALIVARY DIGESTION.

The saliva is a mixed secretion coming from the three salivary glands, and also from numberless very small glands lining the surface of the mouth cavity. This fluid is a viscid, glairy, colorless semifluid secretion of a feebly alkaline reaction and a specific gravity of 1.003. From one to three pints are secreted every twenty-four hours. Less than one part in a hundred consists of solids, chiefly mucus, albumin, various inorganic salts, and ptyalin, the digestive ferment; the rest is water.

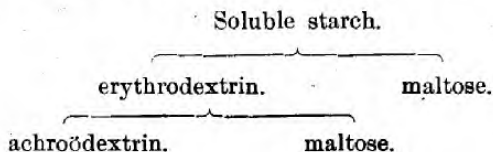
The flow of saliva is intermittent, and is always excited by the presence of food in the mouth. In the intervals between the meals the flow is very scant and only sufficient to moisten the mouth properly and assist in articulation. Even the thought of a savory food or pungent taste will produce a copious flow. Mastication also excites the flow of saliva. Indeed, one investigator has demonstrated that the flow on the side of the mouth where the food is being chewed is three times as great as on the other side. The character of the food itself has much to do with the amount of secretion. Experiments show that dry food produces the most abundant secretion. In a series of experiments conducted by Dr. J. H. Kellogg, it was shown that one ounce of granose (a well-baked preparation of whole wheat in dry, thin flakes) produced two

ounces of saliva in five minutes. The same quantity of moist bread produced but one ounce, an ounce of pea soup only about one-fifth of an ounce, and an ounce of water less than one-tenth of an ounce of saliva. In other words, the dry granose produced more than twenty times as great a flow of salivary juice as the water.

These experiments are very significant, and clearly indicate that sloppy food and drinking with the meals interferes with salivary digestion, and leads to dyspepsia. Such foods are seldom sufficiently chewed and consequently not properly mixed with saliva, and thus escape the action of this juice.

As soon as the food enters the mouth it is seized by the tongue and placed under the teeth to be ground into fine particles. By means of thorough mastication the saliva is well incorporated into the food, and salivary digestion then takes place.

But saliva, or rather ptyalin, which is the active agent, does not digest all foods. Its digestive function is confined to the cooked or soluble starches which it converts into dextrins and sugar, as indicated by the following diagram:—



Maltose is a variety of sugar having the formula $C_{12}H_{22}O_{11}$, — H_2O . As indicated by the formula, it is closely related to cane-sugar, $C_{12}H_{22}O_{11}$. Both dextrins are intermediate products, and, as the diagram shows, not all the starch is converted into maltose or sugar.

Raw or uncooked starch is practically indigestible, and is not a wholesome food. Each granule of starch is surrounded by a woody envelope, which the digestive juices can scarcely penetrate. Cooking causes these granules to swell, and the capsules break, allowing the saliva to penetrate the starch and convert it into sugar. Prolonged cooking has a still further effect; namely, that of changing some of the starch into dextrin. This explains why the crust of a loaf of well-baked bread is sweeter than the pulp. Toasting a piece of bread so that it is nicely browned through, makes it at once more digestible and more palatable. Bread thus prepared is called zwieback, from the German, twice-baked.

When the food has been well reduced and mixed with saliva, it is swallowed, and on reaching the stomach undergoes a double digestion, as we shall learn later.

BASKET-MAKING IN SCHOOL.

MRS. E. M. F. LONG.

[This is the first of a graded, progressive series of lessons to be given monthly in the EDUCATOR. Teachers who do not wish to begin this interesting line of manual training until the fall term, will find ample time to perfect themselves in the earliest lessons during the vacation. Preserve your EDUCATORS, and call the attention of your teaching friends to this opportunity.—ED.]

THAT manual training as an educational factor is not a modern idea, is evidenced by the history of pedagogy for centuries back. It has stood the test

of the child, certain qualifications are necessary. It should be able to command and hold the interest of the child; it should be capable of systematic progression; it should cultivate the artistic sense by means of beauty of form and harmony of colors; it should demand a reasonable degree of accuracy in execution; it should satisfy the child's natural desire to create; and since the first question with every child is always "What is it for?" every object made should be for some definite purpose.

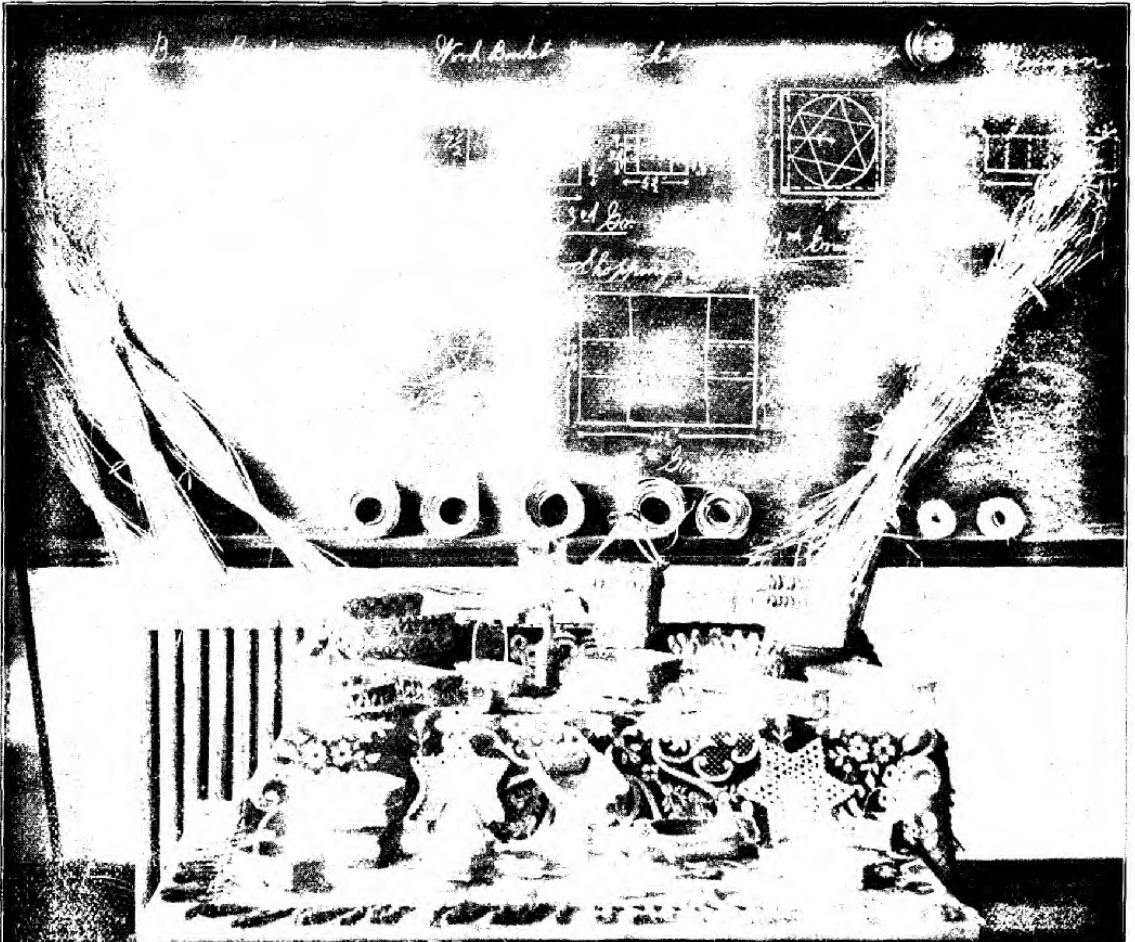


FIG. 1.

of criticism and opposition, and is no longer regarded as an experiment. On the contrary, it is now recognized by leading educators of all lands as one of the most important and indispensable influences in formal education. To answer the desired end, which is the symmetrical development

Among the various forms of manual training that are recognized as possessing these qualifications in a large degree, basket-making ranks high, although it is perhaps least known and understood of all. The primitive methods employed by the Indian (shown in Fig. 3), who would find it im-

possible to make a basket of a given size or to make two baskets of exactly the same proportions or dimensions, could scarcely be said to be valuable educational aids; but as the work has been systematized and adapted to school methods, it has been found to possess surprising possibilities of development.

Various kinds of material have been utilized, but the most successful work has been done with that prepared from the leaf of the palmetto and the wood of the black ash. The palmetto (see Fig. 2) is a native of the tropics. It is found in the West Indies, the Bermudas, and the extreme southern part of the United States. It attains a height of forty or fifty feet, with leaves varying from one to five feet in length. These furnish the material for hats, mats, and baskets.

The leaves are prepared in strips one-eighth inch in width and from two to three and one-half feet in length, and can be obtained in a limited variety of colors. Work in this material is adapted

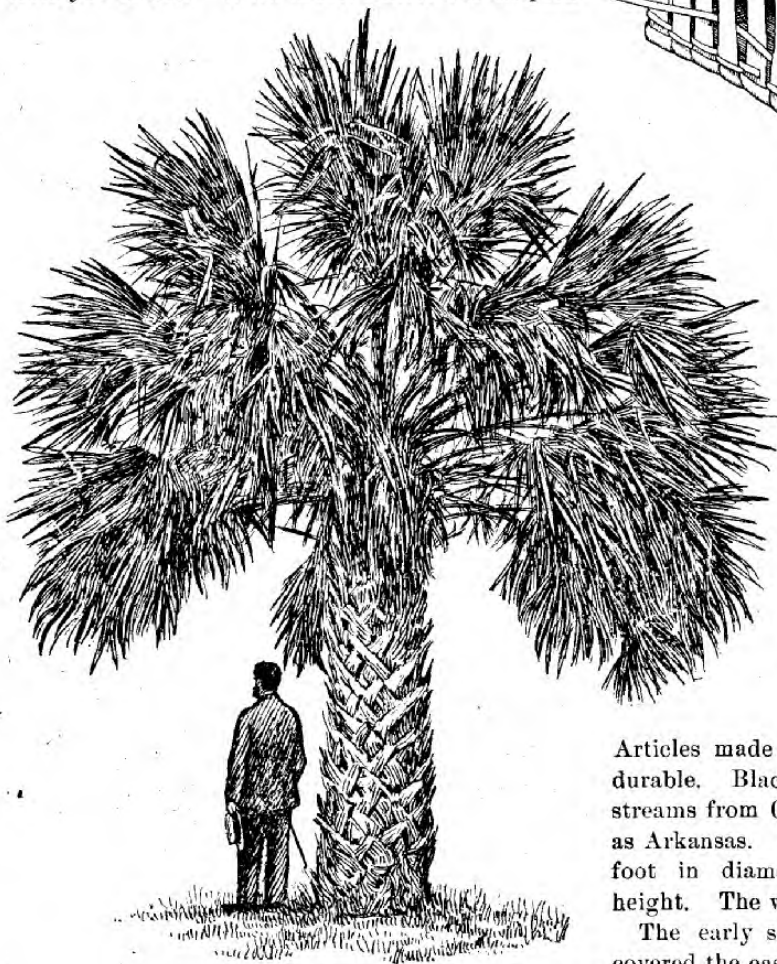


FIG. 2.

to the first three grades, and so simple is the method which has been devised that the children in these grades readily acquire the ability to produce baskets correct in form and of creditable workmanship. Fig. 1 shows one corner of a schoolroom where basket-making is taught. The working drawings on the board illustrate the first step of the work. The upright bundles of pal-

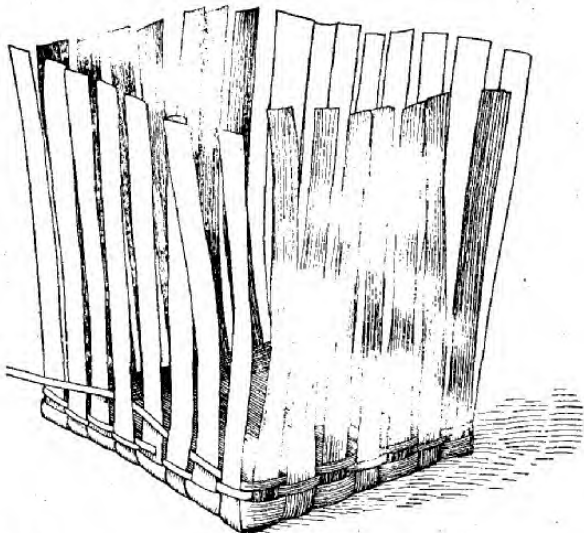


FIG. 3.

metto leaf show the prepared material, and the finished work on the lower table is the practical result of the eager, delighted efforts of children from seven to nine years of age. The articles are all symmetrical, well made and useful.

The work on the upper table was made by children from ten to twelve years of age, of material furnished by the body of the black ash—a tree no doubt familiar to most readers of this paper. Some of the prepared material, called "splints," is shown in the rolls at the base of the blackboard.

Articles made from this material are strong and durable. Black ash is found in swamps and along streams from Canada to Virginia, and as far west as Arkansas. It is tall and slender, being but one foot in diameter to sixty or seventy feet in height. The wood is coarse-grained and tough.

The early settlers in our Northern States discovered the ease with which the wood of the black ash is separated into thin layers (see Fig. 4) and

utilized it extensively for seating chairs, making baskets, and for other household requirements. It is quite generally supposed that these industries originated with the Indians; but upon making some inquiries while visiting among them a year or two ago, I was informed by one of their oldest and best workers that they were taught the use of splints by the early white settlers. As civilization progressed and the need decreased, the whites gradually dropped the work, and for many years the Indians have had nearly a monopoly of it, and have developed a considerable degree of mechanical skill. This is largely lost sight of, however, by reason

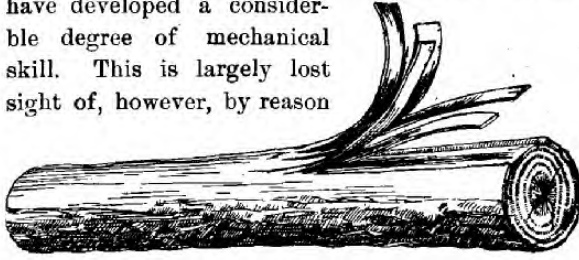


FIG. 4.

of their inaccuracy, lack of attention to details, and complete ignorance of the harmony of colors.

The Indian woman seated on the floor, working as her fancy directs, with no thought for anything save speed and the possible amount of money to be obtained from the sale of her work, presents a marked contrast to the work of the schoolroom, where every detail is carefully planned before the actual work begins; where correct position, accuracy of dimension, symmetry of form, harmony of colors, strength and utility of design, neatness of finish, and thoroughness in every particular, receive careful attention. But while perfection of workmanship is the constant aim, it should be clearly understood that the chief value of the work never lies in the finished product, but in the benefit which comes to the child through producing it.

Lengthy arguments are unnecessary to convince the live, earnest teacher of the educational value of this line of work; and to such a teacher it presents few real difficulties. A long course of study is not necessary. Although there is practically no limit to its possibilities, a few weeks of persevering effort will amply qualify one to introduce it into her school. Another desirable feature is that its introduction need not be expensive. A few simple tools such as almost any child could provide himself with is all that is absolutely necessary. A small monthly charge should be made to cover expense of material.¹

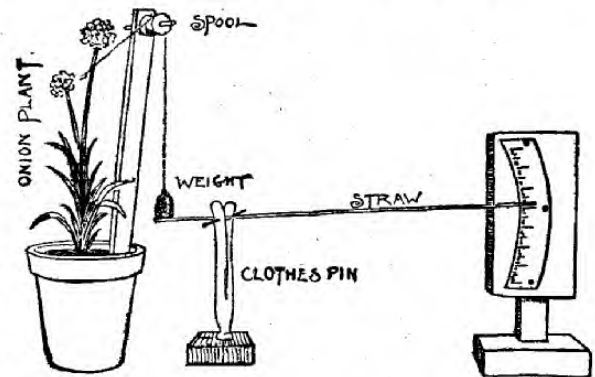
¹THE EDUCATOR will be prepared to furnish needed material, or lowest quotations on it, as soon as a sufficient number of teachers indicate their desire to be supplied.

A PLANT REGISTER.

It has long been a common practise to study botany by a process of "analyzing" plants, the results of this analysis being permanently recorded in a tabulated record. Then this record is laid aside, perhaps in the attic, and the student is supposed to know at least as much about the subject as he did before. The *Detroit News-Tribune* suggests a new form of plant register, that has the merit of producing a graphic impression on the mind, as it enables the student of plants to consider "how they grow."

This device, which is illustrated below, can be made by any ingenious boy. All that is required is any empty spool, a wooden clothes-pin, a bullet for a weight, a piece of string, a short length of board, a wooden stick, and a rye or wheat straw. The spool is fastened to the stick by a nail, so as to turn easily at right angles with the stick, which is set firmly in the flower-pot containing the plant. The clothes-pin is nailed or glued to a wooden base, with its prongs upward, and between these the straw is pivoted on a strong pin thrust through both.

Now fasten the weight to the string, pass this over the spool, and tie it carefully around the tip of the plant; the onion is one of the best for this



experiment. Let the weight rest on the short end of the straw, so that the longer end will have an exaggerated movement over the scale. This will make the rate of growth more noticeable.

You will find that the onion will grow faster at one period of the twenty-four hours than at another. It is interesting to keep a record of its peculiarities, and compare them with those of other plants. A few hours spent in this kind of actual observation of nature, is worth more than days and weeks of mere book study. Try this in your home or school, and report results to this department of the EDUCATOR.

"EYE-TO-EYE" TALKS.—III

[This series of contributions to the *EDUCATOR* is designed to afford a medium for that kind of face-to-face study—question and answer—that should lead to greater unity of educational thought and action. The purpose is not argument or discussion for the sake of discussion, but candid interrogation and response for the sake of light and clearness and practical application; not to see "eye through eye," but to see truth mirrored in our brother's eye. This column is free to all seekers. Send in your questions and contributions. As truth only is the object of search, the question of personality is of no importance; so the matter under this title will be published unsigned.—Ed.]

KEENE (TEX.) ACADEMY, May 8, 1899.

Editor Christian Educator:

I send you an article on language teaching which I would like to have published in the Department of "Eye-to-Eye Talks," over my own name.

I noticed the suggestion that articles for this department need not be signed, and I suppose the thought was that persons would write more freely if unknown. But, however others may feel, for myself I would like to know into whose eyes I am looking when he talks, and when I talk back. The fundamental thought of such talks is frankness, openness, cordiality. And the idea of talking eye-to-eye with a man whose eyes, gleaming through a mask, are all you can see of his face, would be laughable if it were not for the suggestion that perhaps he might be a highwayman. It forcibly illustrates the possibility of obeying the letter without catching the spirit.

So, Mr. Editor, please print my name with the article. I am not ashamed of it; for it is the best I could do. I am not afraid of any bad results to myself; for it expresses my honest convictions, and if they are wrong, no one will be more happy than I to have the error pointed out. And I do not think it will wound any one else; for there is no malice in it.

Please, also, print this explanation.

C. C. LEWIS.

[In cheerfully complying with this frank request, the *EDUCATOR* takes the opportunity of saying that all future contributors to this department may feel at perfect liberty to attach their names *without* any explanation. The editor has sometimes thought that the value of the *EDUCATOR* might be enhanced if none of its articles were signed. There is sometimes great advantage in presenting truth impersonally. We often weigh a statement, not by its own intrinsic merits, but by the personality of its

author, and make allowances accordingly either above or below its par value. Some men's utterances go at premium or discount, according as we think we can discern some motive of self-interest or prejudice underneath. But the foregoing epistle would certainly disarm such a thought. The article referred to follows.—Ed.]

SOME THOUGHTS ON LANGUAGE TEACHING.

C. C. LEWIS.

LITTLE children should not be taught the technicalities of grammar. They are not thus taught in the best public schools. They have language exercises, in which they learn to interpret printed language, and to write out their own thoughts in proper form.

Older children should be taught formal grammar. My own children are being thus taught, and they shall have as thorough a training in technical grammar as I can procure for them. When a boy I had such a drill myself. It was continued under the best language teacher Seventh-day Adventists have produced—Professor G. H. Bell; and it has been confirmed by twenty-five years' experience as teacher, editor, proof-reader, and speaker. I would not have had a whit less of formal grammar. I have needed it all. It helps me to understand printed language in all shades of meaning, and it helps me to speak and write more clearly and more forcibly. It makes me less liable to violate the principles of correct language; for if I did not know what was right in language, I would be liable to do wrong, even if I wished ever so much to do right. The study of formal grammar cultivates that close observation and care which are necessary to the formation of correct habits of speech. I do not say "The Lord is good to you and I;" for I know better, and have formed my habit according to correct knowledge. If we had all been trained to correct habits from infancy, and had never heard and learned incorrect forms, the study of grammar would be less needed; but under existing conditions it is the best way to correct bad habits of speech.

Another advantage to be gained from the study of grammar, especially from the analysis of sentences, is the training of the reasoning powers. When properly conducted, I have come to regard

it of as great value in this respect as the study of mathematics. The thought was put into the sentence by a process of synthesis on the part of the author; it is extracted by the student through a reverse process—that of analysis. Even though the analysis be general and of lightning-like rapidity, it is still analysis. The question as to whom or what the author is speaking about is determined by discovering the complete subject; and this subject is a leading part of the whole sentence. The separation of the whole into parts, and the perceiving of the relation of those parts is both analysis and reason; it is “analytic reasoning.” Every sentence has two main parts—subject and predicate. But these parts are often so complex that it becomes necessary to enter into the study of the sentence further than to determine these two points. By so doing we detract nothing from the beauty and force of a sentence, while we greatly add to the clearness of our understanding of the thought.

I have often stood before pupils in the class, and have watched their faces as they struggled mentally with the thought presented in the sentence, and have seen them light up with glad surprise as the author's meaning became clear through the sudden discovery of relations not at first perceived. Just so, often, in the study of a flower, while the student is deeply impressed by the beauty and freshness of the whole, he gains new and more wonderful views of his Heavenly Father's wisdom and love from the unexpected discovery of some hidden beauty or adaptation of the parts, which could never have been obtained from the study of the flower as a unit. And the injury to the flower is more than compensated by the advantage to the man. Indeed, nature would soon have disconnected and scattered its parts and destroyed its beauty, even if he had not.

And this careful analysis of sentences, this study of technical grammar, can be carried on with examples selected from the Bible. All the forms and modifications of the verb can be taught from Bible illustrations. A clear knowledge of infinitives and participles may be gained from the same source. Some have questioned the propriety of teaching grammar in this way, and have thought that to do so would be to put the Bible to a use for which it was never intended. Similar questions have come to my own mind; but if it be not appropriate to teach grammar in this way, what shall be said of arithmetic, with the grotesque combinations sometimes produced in an effort to make problems from Biblical material? For my own part, I believe that formal grammar can be safely taught

from the Bible by a skilled and reverent teacher, although I have never attempted it, except occasionally from detached sentences. But even if we could not, and should not, teach formal grammar from the Bible (propositions not yet established), I do not think we are shut up to the conclusion that our methods of teaching grammar are wholly wrong. There may be another conclusion; namely, that it is erroneous to suppose the only way of making the Bible the basis of study is to place it in the child's hands for a text-book in every subject. May this not be an extreme view? And may not the true basis consist in having the principles of the Bible so inwrought into the teacher's life that whether he teaches Bible or arithmetic or grammar, the Christ-spirit in him shines out and diffuses itself throughout the very atmosphere of his school life?

[The following account of the educational work done in Battle Creek College and her sister institutions, is a much more intelligent and candid statement than generally finds its way into the public press. It is from the *Detroit Sunday News-Tribune*, and we reproduce it with the original head lines.—ED.]

THE BIBLE AS A TEXT-BOOK FOR ALL STUDIES.

STRANGE FEATURE OF THE ADVENTISTS' NEW SYSTEM OF DENOMINATIONAL SCHOOLS.

THE Seventh-day Adventists are the only people in the United States who use the Bible as a text-book in teaching. Because of their belief that the Bible is the source of all knowledge, they are taking their children out of the public schools, and are opening denominational schools throughout the country, in charge of their own trained teachers. In doing so, they are making no war upon the public schools. The Adventists started these schools only last fall, but already have fifty-five in operation.

The Adventists look upon Christ as an educational reformer, the center of all spiritual life in the world. All religious movements, they say, were accompanied, often preceded, by a reform in educational methods. As a child, Christ refused to receive his education from the Jewish rabbins, because years of stagnation and the strict adherence to tradition had worn away the life of their educational system as given them in the days of Moses. Meaningless repetitions, a senseless jargon which stunted mental growth instead of stimulating it, compelled the youthful Son of God to look to his Father and the will of God as revealed in nature for the instruction necessary to fit him for his life work. By communion with God and nature, a perfect character was developed. Here, in brief, is the basis for the belief among Adventists that a religious training is due their children.

For years the Adventist colleges and academies have been modeled after corresponding institutions of learning throughout the United States. Recently, however, a decided change has been made, and the Bible is now the basis of all educational effort. This is not to say that the Bible is the only book used, but that the word of God is held to be the only source of pure, unadulterated truth; it is, therefore, the first text, and other authors are used for reference in gaining facts. The Adventists hold, as Rollin expressed it in the early days of the eighteenth century, that a Christian teacher is "a man in whose hands Jesus Christ has placed a certain number of children whom he has redeemed by his blood, in whom he lives as his temple, whom he regards as his members, as his brethren, as his coheirs. . . . And for what purpose has he confided children to them? Is it just to make poets, orators, philosophers, and scholars of them? It is for the purpose . . . of making true Christians of them. This is the end of education, and all the rest holds the place of means."

That this purpose may be most fully realized, the Adventists argue that their children should receive a training at the hands of persons who believe in the doctrines peculiar to their church. Battle Creek College, their largest and oldest educational institution, is a training-school for Christian workers, teachers, and missionaries. Since the first of October, 1898, fifty-five workers have been sent from Battle Creek to instruct the children. Most of these have gone into Michigan, Wisconsin, Indiana and the bordering States, but a few have found their way farther west, even to the Pacific coast; two or more have gone south, and several others east.

While the Bible is considered the first source of all wisdom, the book of nature is placed next to it, and nature study is made decidedly practical. Manual training is a strong feature of the Adventists' educational system. Each student is given an opportunity to learn a trade that will render him self-supporting.

During July and August next, an institute will be conducted at Battle Creek for the training of teachers. It will probably be the largest gathering for such a purpose ever held by the denomination.

SUMMER SCHOOLS.

THE Battle Creek College and the Keene Industrial Academy each announce a special summer term of training school work. The Keene school begins June 14, and will continue twelve weeks, or longer if the interest warrants. Full particulars

may be had by applying to the Principal, C. C. Lewis.

The May number of the *Training School Advocate* contains a special announcement of the summer term in Battle Creek. Copies of this number will be on sale at the various camp-meetings, at five cents each. A high-school teacher recently received a sample copy of the *Advocate*, and commenting upon it in a letter, says: "The *Advocate* is the most exciting little piece of literature I have met in a long time. Do they believe the Bible should be made the text-book in *all* branches? What do they mean by Bible farming?"

These are questions upon which many are now asking for definite information. And such questions can not be agitated before the information is forthcoming without prejudicing the interests of our educational work. So it is the duty of all to become informed, and then to disseminate this information as widely as possible. The *EDUCATOR* commends the effort made in arranging for these summer schools. They should be largely attended.

THE Battle Creek [Adventist] College has inaugurated a singular scheme for a college. The faculty are plowing up the campus, comprising about five acres, and will make a garden of it, the students to do the work, and the proceeds of the sale of truck to be devoted to missionary work. There are now no grounds for baseball and football games.—*Michigan School Moderator*.

Rather a "singular" scheme; in fact, too much so. Nevertheless the cultivation of the soil and the raising of "truck" may prove quite as humanizing and uplifting as the average baseball and football games. At least the experiment seems well worth trying.

Do you make it a practise to read the *preface* of every book which you intend to read or study? Do you know that if a book is worth reading at all, you will get more value out of the preface than from any equal number of pages after it? That confidential talk under the heading, "Our Special Coupon Offer," constitutes the preface to this number of the *EDUCATOR*. We wish every one to read it, and then go to work under the conditions of our new proposition. Don't miss *this* opportunity.

THE following example illustrates the value of punctuation, an art that has gone out of fashion with some persons:—

That that is is that that is not is not.

If this statement is not perfectly clear, turn

over the leaf, and see how easily it might have been written in this way:—

That that is, is; that that is not, is not.

BOOK NOTICES.

LAST month the EDUCATOR had occasion to refer to the value of Alfred Ayers's "Verbalist" as a reliable guide in the use of words. Since then we have received a companion volume, "The Orthoëpist," which deals with the subject of pronunciation. Both of these books are the result of many years of close observation on the more subtle distinctions of English usage, and they are recognized as standards of authority. They state not only the facts but the reasons for the facts, and thus furnish the student a secure possession of accurate and permanent knowledge. "The Orthoëpist" is a book of 290 pages, the words being arranged in alphabetical order, with notes, comments, and authorities given in the body of the text where they are needed. "The Verbalist" has 325 pages, with an alphabetical index to all the words treated in the text. It abounds in notes and illustrations concerning the proper use of misused words. Both books are handsomely bound in brown cloth, with gilt edges. It is difficult to say which book is of greater value to the student, writer, editor, teacher, or public speaker. We wish every reader of the EDUCATOR owned "The Verbalist," and then he would be sure to want "The Orthoëpist." Either book can be had, post-paid, for \$1.00 by ordering from the EDUCATOR.

On another page we publish an advertisement of "Almost a Woman," and "Almost a Man," two excellent little books issued by the Wood-Allen Publishing Co., Ann Arbor, Mich. Both are from the pen of Dr. Mary Wood-Allen. This fact is a sufficient guaranty of their value to every parent who shrinks from the duty of giving needed instruction to youth who are entering upon manhood and womanhood. This critical period is often approached and passed without those safeguards of confidence and wholesome information that would preserve our youth from vicious influences and habits that affect not only the life of the individual but the sacred interests of posterity. If you are the father or mother or sincere friend of any young man or woman who has not received this help toward a higher life, send for one of these books. It may be ordered to your advantage through the EDUCATOR. The booklets are of forty-five pages each, illustrated and written with such

directness and delicacy that they can be put at once into the hands of son or daughter, but deserve as well to be studied by every parent. It is easy to forget or to ignore the peculiar dangers of the adolescent period and leave the youth of our own household destitute of that sympathy and wise comradeship which is the highest mark of parental faithfulness and love. Inform yourselves, parent and teacher, concerning your duty to the youth.

OGDEN, IA., May 2, 1899.

To the Editor:

A friend lately handed me a sample copy of the CHRISTIAN EDUCATOR, which I have read with much pleasure and profit. The articles, "A Criticism," and "Another Criticism," were especially interesting and helpful. I enclose twenty-five cents with the Special Coupon for one year's subscription.

MARY E. GARVIN.

[Miss Garvin has kindly pointed out one typographical error in the April EDUCATOR—"course and rough" for "coarse and rough." It is the only one so far reported. We are glad that the EDUCATOR is read critically.—ED.]

? Queries for Students ?

[This is a standing subdepartment for the benefit of all who are students. It should enable every one to read the EDUCATOR and every other paper more intelligently. All these "Queries" are taken from the articles in this number of the paper, or directly suggested by them. They are excellent for general information exercises in the school and home. The EDUCATOR will be glad to credit the best set of answers to these questions, sent each month, by school or individuals.]

1. Meaning of?—singular, peristaltic, parotid, connivent, glairy, Centropolis, the sensibilities, indention, *Poa pratensis*, verve, misinformation.
2. Distinction between?—vocation and avocation; maternity and motherhood; phonograph and graphophone; verse, stanza, and paragraph; grammar, rhetoric, and literature; pupil, student, and scholar.
3. What is?—chyme, pylorus, pancreas, larynx, pharynx, ptyalin, a ferment, granose, maltose, erythrodextrin, achroödextrin, sarcoma, a platitude, hibiscus, the Pentateuch, "higher criticism," a euphemism.
4. Who?—Richter, Wagner, J. G. Holland, Ptolemy Philadelphus, Swedenborg, the author of "A Daniel come to judgment," of the stanza on page 240.
5. Pronounce—parotid, Arkansas, tremendous, superfluous, erythrodextrin, achroödextrin.
6. Define—alimentary, cardiac, desiccated, perennial, brochure.



Two Booklets for Parents.



ALMOST A WOMAN.

By Mary Wood-Allen, M. D.

PRICE, 25 CENTS.

Every mother should prepare her daughter for the changes that accompany development into womanhood. Many mothers do not know how best to give this instruction. They neglect this duty; invalidism for the daughter is too often the result.

"Almost a Woman" gives this necessary instruction, in the form of a mother's talk with her daughter. Read what a few have said of it:—

CLEVELAND, OHIO.

Your little book, "Almost a Woman," can hardly fail to meet with a warm welcome from puzzled teachers and parents, and to be of great value to thousands of young girls. The womanliness in any girl must, I should think, respond to the womanly frankness and dignity with which you have treated your subject, and its clear and simple language brings it within the scope of the understanding of the average girl of twelve or thirteen.—*May H. Prentice, Training Teacher, Cleveland Normal School.*

BOSTON, MASS.

My satisfaction with this little book increased with every page. It is just what young girls need, and supplies a want long felt by mothers—the presentation in well-chosen language of what girls ought to know, but which mothers find difficulty in telling. Many a girl, "lost through ignorance," might have been saved by reading this book. The form, a conversation between a mother and a daughter of thirteen, is well chosen and attractive.—*Abby Morton Diaz, Women's Educational and Industrial Union.*

THE TEMPLE, CHICAGO, ILL.

I received your little booklet, "Almost a Woman," and upon reading it was delighted with the subject-matter, and the manner in which it was handled. I placed it in the hands of my daughters, eleven and thirteen years of age, and I am sure it will be of the greatest benefit to them for many years to come. I wouldn't have had them fail to receive this information for many dollars. Please accept my greatest thanks for the book, and my gratitude as a mother of girls that you were inspired to write it.—*Minnie B. Hornung, Nat'l Supt. Press Dept. W. C. T. U.*



ALMOST A MAN.

By Mary Wood-Allen, M. D.

PRICE, 25 CENTS.

A frank talk to a boy who was "almost a man," and the good it did him. As it is in story form, every boy will read it, and be the better for it, as was the boy in the story.

It is intended to help mothers and teachers in the delicate task of teaching the lad concerning himself, purely, yet with scientific accuracy. Here are a few statements from recognized authorities concerning its value:—

I find it invaluable in my work among students.—*Margaret Hamilton, Shaw University, Raleigh, N. C.*

OLYMPIA, WASH., Jan. 16, '96.

Your booklets are a blessing to mothers, young children, and developing boys and girls, and my heart goes up in heartfelt gratitude for them. My boy, fourteen, said after reading "Almost a Man," "Mama, I feel better after reading that book; my thoughts are higher."—*Nellie P. Whitman.*

Two excellent little brochures have recently appeared from the pen of Dr. Mary Wood-Allen, of Ann Arbor, Mich. They are entitled "Teaching Truth" and "Almost a Man." There is no more difficult problem to face and no more delicate duty to perform, than that which concerns itself with the oncoming sexuality of the child. The author has certainly helped parents greatly in their endeavor to deal with what has always been a delicate and difficult task. She certainly has a sympathetic understanding of the problem, and treats it most intelligently in a graceful, skillful, and most reverent manner. We wish that every parent and every teacher who must needs deal with the child at the onset of pubescence and early adolescence could be familiar with the contents of these little booklets, for they would serve to save the child, who understands so little about his organism and the revolution that takes place at the period of pubescence, from much that is vicious.—*Child Study Monthly, September, '95.*

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(Continued from second page of cover.)

proposition: We will give you a year's subscription to the EDUCATOR free, either new or as a renewal, if you will send, with your own name, *four new subscriptions* at the regular price of *fifty cents each*. That is, you send your own name as one of the five subscribers—of whom four must be *new*—with a money-order for \$2.00, and you will receive the EDUCATOR free for one year from the time you wish your own subscription to begin.

Again: You can receive the EDUCATOR free for one year by sending us *nine new subscribers* (besides yourself) at *thirty cents each*. You send their names and your own with \$2.70, and receive your own subscription on the same conditions as above. It ought to be as easy to get nine new subscribers at thirty cents each as to secure four at fifty cents each; and there would be the added satisfaction of doing that much more to extend the benefits of the EDUCATOR to a larger number.

Still again: If you secure twenty-four new subscribers they will be received at *twenty-five cents each*. That is, you send in twenty-four new names, your own, and \$6.00, and receive your own EDUCATOR free. In countries outside of the United States and Canada, ten cents must be added to each of these subscriptions for the extra cost of postage.

We believe that many of our readers will embrace this new opportunity to extend the circulation of "our EDUCATOR." If the response is prompt we expect to publish the names of all who will assist by sending in these lists of five, ten, and twenty-five subscriptions, under the conditions indicated above. It will be required that each sender shall indicate clearly that all the others are *new* subscribers, whether his own is new or a renewal, and whether the club may be mailed in one package or to single addresses. *Let us hear from you.*

OUR NEXT NUMBER

May appropriately be called the "Church School Number," and will be of very special interest to all who are seeking help in this fundamental line of Christian education. We are already able to announce the following articles for our June issue:—

Need of Reform in Educational Work, Mrs. E. G. White.

Christian Education, Prof. J. E. Tenney.

The School of the Future, Prof. E. B. Miller.

How Shall We Study Nature? Prof. M. E. Cady.

Unseen Force in Character-Making.

Maternity and Motherhood.

How to Organize a Church School.

Classified Answers to Questions recently sent out to all our church-school teachers.

These reports from actual experience will be of the highest value in future work. All should read this condensed statement.

Besides these special subjects, and others that can not yet be definitely announced, there will be an illustrated article on Industrial Work in Healdsburg (Cal.) College, and another—crowded out of this number—on How the EDUCATOR'S Illustrations Are Made. This will supplement the article on How the EDUCATOR is Printed, and furnish much valuable information.

This number will be one of the best ever issued by the EDUCATOR, and a sample copy can be had *free* if your order is sent at once.

Below is a special form that should be used in ordering sample copies for your friends. We trust our readers to send only the names of persons who are known to have an interest in such subjects as are presented in the EDUCATOR. We hope for *returns* from every sample copy thus sent out.

USE THIS BLANK

or a sheet of paper arranged in this form, in sending requests for additional copies of the "Christian Educator." Free sample copies of this paper, will be mailed to any friends whose names and addresses are sent by you. Please indicate whether they are members of your church, as follows:—

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Address.

Church.

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