CLASSROOM METHODS AND DEVICES

A Sixth-Grade English Unit

Search for a topic which would be of genuine interest to eleven- and twelve-year-old boys and girls, and which would, moreover, open to them a broader view of some of today's work in the world, led to the selection of the subject "Ships and Ship-building." The purpose of this article is to sketch the development of the topic as worked out with a group of sixth-grade children.

The children's own experiences with boats or ships of any kind were utilized to introduce the topic. These stories were told orally to the class. The variety of experiences was surprising, and interest increased steadily as the stories multiplied. Use of the suspense element in interesting others and clever selection of titles were two of the several good points discovered by the children in the following accounts.

A Vessel in Distress

One evening at dusk, on our way home from Europe, the look-out reported that he had seen sky rockets in the distance signifying distress. According to the rules of the sea, the captain was compelled to find out the trouble and, if necessary, send help. He changed the course of his vessel toward the sky-rockets. After two hours we sighted the vessel. The captain of our ship tried to speak to the vessel through a megaphone, but they failed to hear us on account of the severe storm which had been raging for two days. Six men then volunteered to go over to them in a life-boat. The sea was so rough that it took them over half an hour to lower the boat. It was now dark and very soon the little boat was out of sight. For two hours we waited. Their return was greeted by cheers from the passengers. After being taken aboard, they reported that the vessel was a tramp steamer bound for Holland with a cargo of oil from South America. She had lost her propeller and wished to be towed. As we were going in the opposite direction, they had to wait for another vessel.

A New Kind of Sail-Boat

When my father was a little boy, he always spent the winter in New Orleans and the summer in Kentucky. One autumn when the family were going up the Mississippi River, a very funny thing happened. Father was on the top deck looking up the river when, all of a sudden, he heard a scream from

the nurse who was standing near him. A few minutes before, she had been holding a chubby baby in her arms. Now she was empty-handed. She stood there screaming and pointing to the water. There was the baby floating along the river. The baby's dress had a very long, full skirt, and a strong gust of wind had carried the baby from the nurse's arms to the water. There the skirt, being full of air, helped the child to float gently along until it was rescued. The baby had enjoyed the ride, and was none the worse for its wetting.

SAND FROM THE BOTTOM OF THE SEA

One day while crossing the Atlantic Ocean, I was up early enough to see them take the soundings. They do this to find out how deep the water is. To take the soundings, they used a long rope with a tape measure running the whole length of it, and a heavy weight on the end, surrounded by a thick layer of fat. This sank quickly to the bottom of the ocean as they let out the rope. Then the captain gave an order to haul it up, and many sailors tugged on the rope until the weight came into sight. The fat was now covered with a grayish layer of tiny grains of sand. The captain, when I asked him for it, gave me some of the sand, so that I could bring home with me a bottle of sand from the bottom of the sea.

In these reports, mention had been made of boats and ships as widely different as tugs, colliers, yachts, schooners, ocean liners, war ships, and canoes. Distinctions were discussed orally, and many of the children started scrap books containing pictures of as many as possible of the kinds discussed. Though the subject of ship-building had at no time been mentioned to the children, pictures of ships in construction soon began to appear in these scrap books—particularly in those of the boys. "Building a Three Decker"; "The 'Rivadavia,' Nearing Completion at Quincy, Mass."; "The Latest Work in Shipbuilding—The White Star Line's New 'Brittanic'"; and "Turbines Being Hoisted on Board the 'Aquitania,' now building at Clydebank" were titles of some of the illustrations secured.

To all the class, excepting two boys particularly interested in hydroplanes and hydro-aeroplanes, the great ocean liners seemed more attractive than any other vessels. This preference directed the course of procedure and led the class to write letters to the best known ocean steamship lines for further information. Each child chose the company to which he or she wished to write. Many asked permission to write to several. The substance of all the letters was much alike. The two below give some idea of the

individuality of expression exhibited. Answers were awaited with much interest.

CHICAGO, ILLINOIS,
Jan. 19, 1914

Hamburg American S. S. Co.,
New York, N.Y.

DEAR SIRS: I am finding out all I can about ocean liners, and am collecting pictures of them. Would you be kind enough to send me some pictures of your largest steamships and information concerning them and the routes they sail?

Yours truly,

——— K. AVE.
CHICAGO, ILL.

CHICAGO, ILL.,
Jan. 21, 1914

Cunard S. S. Co.,
New York, N.Y.

DEAR SIRS: Will you please answer for me the following questions concerning your steamships? What are the names of your largest boats? How large are they? Where and how are they built? What are your principal sailing routes? I shall be grateful for any pamphlets about them or pictures of them which you can send me.

Yours truly,

——— W. AVE.
CHICAGO, ILL.

While awaiting the replies to these letters, the class read the stories of the two famous prehistoric boats, the Ark and the "Argo." The biblical version of the Ark story was read, talked over, and re-read. Additional motivation for expressive reading of the passage lay in the knowledge that one child was to be chosen by the others to read the story in the morning exercise on ships that the class had been asked to give before other classes.

After the reading of the story, opportunity was given for two modes of self-expression. First, the written story of the Ark was reproduced in the children's own language. Then a crayon drawing of the Ark, as the child conceived it, was made. Owing to individual differences, the amount of biblical diction which was carried over into the children's accounts varied widely. The two copied below were chosen to illustrate this particular point.

NOAH'S ARK

The Lord requested Noah to build an Ark, so that when the flood came, he could preserve himself, his family, and the various animals. It was built of gopher wood, which we now call conifer cypress. The Ark was five hundred twenty-five feet long, eighty-four feet wide, and fifty-two feet high. It was not built for travel, and merely floated about until the flood subsided.

NOAH'S ARK

Many, many years ago, not long after the time of Adam and Eve, the Lord saw that there was nothing but evil in the mind of man whom he had created. So God determined to send a flood and wash the face of the earth bare from man. In this dreadful time, there was but one patriarch who won favor in the sight of the Lord. This was Noah. He only had not forsaken the Lord, and therefore God came unto him saying that a great flood would drown everyone on earth. But God bade Noah build an Ark, which was to be three hundred cubits long, fifty cubits wide, and thirty cubits high. The Ark was to have a window, a door, and three stories. Noah was to go into the Ark when the waters began to rise and with him he was to take his wife, his sons, and his sons' wives. God said he was also to take a male and female of every animal, bird, and creeping thing on earth. And just what the Lord commanded him to do, Noah did.

In the working out of the crayon drawings in the art period, questions such as those of proportion, of coloring, of placing of door and window, of showing three stories, and of the general shape of the boat presented individual problems to be met. The decision was unanimous and no less amusing that no steering gear was necessary because Noah desired only to float. The finished drawings were most interesting.

The "Argo" story was similarly treated. The sources used for this tale were Lowell's *Jason's Quest* and Baldwin's *The Golden Fleece*. Since only one copy of each was available, each child read in turn to the rest of the class. English periods did not come often enough to satisfy their desire for the completion of this story, and the class voluntarily held after-school sessions to hear it finished. The little accounts reproduced after just the one hearing were unusually good. Some chose to write of the building, some of the launching, and some of the return of the famous craft.

THE BUILDING OF THE "ARGO"

Jason walked through the land crying, "Who will build me a ship large enough for fifty men?" Men laughed at the idea of so huge a boat, but at

last a man called Argus volunteered to try. One day as he was at work among the timbers on the beach, a beautiful woman came toward him. As she approached him she asked, "What kind of a thing is this?"

"I am trying to build a ship," he answered humbly.

She told him that so poor a craft could never sail the seas and the next moment disappeared. But in her place there stood Athena, the goddess of wisdom. She showed him how to use strong cedars for his hull and for the prow she bade him secure a bough from the talking oaks of Dodona. Before long, with such help, he completed a sea-worthy vessel, wonderful to behold, and after its builder it was named the "Argo."

The Launching of the "Argo"

When the "Argo" was well finished with its head figure of sacred oak, the time came to launch it. With all their might men pushed, but the boat would not stir. Then Hercules was called. With all his mighty strength he pushed, but the ship was not to be moved. Pretending that he had not even tried, he bade his comrades push hard with him. In this way they slightly shoved the stubborn ship, but the men now said their strength was giving out. As they paused for breath, they were astonished by exquisitely soft strains of music. Its sounds stopped the warriors in wonder and suddenly the boat began to move gently and swiftly to the sea. Then they saw that a young bard stood at the prow of the boat playing sweetly on his lyre. They clambered quickly up her sides and were off. Orpheus had charmed the "Argo" with his heavenly music.

The Return of the "Argo"

When the "Argo" sailed into the harbor with Jason and the other heroes it was not the shining craft which had started out, but an old storm-battered, weather-beaten vessel. The face on the prow was bent. The sails were torn. The hull was gray. Nobody knew it was the "Argo."

By the time the "Argo" stories were finished a mass of material (truly alarming in quantity from the teacher's standpoint) had been accumulated from the steamship companies. Several very large pictures had been sent, and pamphlets and small pictures of every description. More delightful to the children than anything else, however, were the personal letters which they received answering some of their many questions. Much clamoring to be first to tell about and show their treasures ensued. The coveted permission was given to the one who showed the best simple outline of facts to be presented. A class hour was spent discussing organization and selection of material. When two or three children wanted to talk about ships of the same company, they decided

among themselves upon the division of the subject to be made. For example, of the three who wrote to the Hamburg American Line, one talked upon the "Imperator," another upon the trip of the "Cleveland" around the world in 1915, and a third upon the "Vaterland"—at that time still in process of construction at the great shipyard of Blohm & Voss, Germany. Several of the children laboriously made extra diagrams and maps of routes to help them picture effectively the exceedingly great size and merit of their respective ships. A mere skeleton of one of these oral reports, taken down by a student assistant as the child talked, is included below.

CUNARDERS

This large picture is of the "Lusitania." This ship is 790 ft. long and has a tonnage of 32,000 tons. If you look down to the water from this deck, you are looking down a distance of 80 feet to the water. Here is a diagram I have made of the Auditorium Hotel. If the "Lusitania" were put down Michigan Avenue in front of the Auditorium, it would reach this far. If you put one of these funnels down on the street, two street cars could run through it at once on double tracks the usual distance apart.

The "Lusitania" has a sister ship, the "Mauretania." They are both fast ships and sail weekly between New York and Liverpool. The "Lusitania" was built on the Clyde, Scotland, and the "Mauretania" on the Tyne, England.

The Cunard Company are now building the "Aquitania" and "Transylvania." The "Aquitania" is already launched. The hull of the "Transylvania" is just being built. This picture shows the fourth funnel as it is being put into place on the "Aquitania." These new boats will be the finest and largest on the line. The names of all the large Cunarders end with "ania."

Needless to say, all this information was divulged to the rest of the class with no small degree of pride on the part of the possessor. As reports multiplied, the children made it a point to learn the names and sailing routes of the great liners, not only of their own, but of all the companies discussed. Then they began, also quite of their own accord, to bring in reports from the daily papers as to the whereabouts of the various ships that day. Atlases were consulted more eagerly than in the geography class. That the "Cleveland" had arrived in Bombay late the preceding night was a subject of before-school conversation.

Perhaps the most interesting report made was upon the French line. This told how all these liners could be converted into war vessels by the French government, and how they were built at the St. Nazaire yards, although they could be built much more cheaply in England, and why these things were true.

As soon as a child had given the report on his material a subject for later report was chosen. This was to be based upon reading done in the library. Unless special request for a different kind of a topic was made, the assigned reading was upon some of the great ships of history. All read and illustrated a chapter upon the evolution of a boat. Individual instruction was given in the use of the card catalogue in finding the books referred to. *The American Sailor*, *The Boy's Wonder Book of Ships*, and E. Keble Chatterton's two volumes were found particularly adapted to children's use. Some of the topics assigned were: "The Norse Boat of Gokstad"; "The Golden Hind"; "The Bucentaur"; "The Great Harry"; "The Blessing of the Bay"; "The Clermont"; "The Great Western"; "The Constitution," etc.

"The Merrimac and the Monitor" was written up by one lad upon his own request.

The children, already not a little familiar from their various reports with the chief shipbuilding regions of the world, and with the parts of a great ship, were now quite ready to study the "Shipbuilding" chapter in Allen's *Industrial Europe*. The personal touch—the picture of the ship-builder as well as of ship-building—was supplied by the teacher's stories of Peter the Great, Phineas Pett, Robert Fulton, and other great ship-builders. Many shipbuilding articles from magazines were brought in by the class, the best of which was from the *Scientific American* of January 31, 1914. It was entitled "The Most Modern Ship-building Plant in the World." Early in the discussion of building ships of iron and of steel, the children were puzzled as to how an iron ship could float. The following is one boy's volunteered effort to explain.

WHY AN IRON OR STEEL SHIP CAN FLOAT

If you put a piece of wood on the water in a basin, like this, you see it floats. We found out in our study of primitive boats that logs floating down stream gave early suggestions of boats. Therefore people were not surprised

when a boat built of wood floated. But if you put a lump of iron in the water in the basin, like this, you see it instantly sinks. So when people first heard of steel ships, they were sure they would sink. I am going to try to show you why they do not. When I put this little iron cup in the water, you see it floats. The secret is in its shape. You see this is not a solid piece of iron but a shell of iron filled with air. The air and the iron together are light enough to be held up on top of the water just as the wood was. The cup sinks to within half an inch of the brim. Then we know that it is lighter than an amount of water just the size of the cup would be. Steel ships are hollow like the cup.

The class next read together Longfellow's "The Building of the Ship" and liked it. Modern ship-building methods were often compared to those of the "master." The parts of a ship named presented nothing strange. The thought-content was easily mastered.

During the study of the poem, five or ten minutes each day were taken up with the reports based on the library work. Some of these were oral and some written. The following one was written.

THE "BUCENTAUR"

Venice is built on islands, with the sea upon all sides. For this reason, and because she had obtained most of her wealth by commerce, she grew to love the sea. Venice felt that the sea loved her, too, and would protect her. From this idea there came to be held a beautiful ceremony called "The Marriage of Venice and the Sea."

Once every year the Doge, or chief ruler of Venice, accompanied by the priests and many attendants, sailed out into the harbor to perform the marriage service. It was the most important of all the holidays of the Venetians and the harbor was gay with throngs of people and bright decorations.

The "Bucentaur," the boat in which the Doge sat, was a beautiful boat. It had two floors or decks. Upon the lower deck sat the men who rowed the boat. The upper deck was covered with velvet and adorned with much gold braid and many tassels. At the stern was a small window from which the Doge cast a ring into the sea, while the priest solemnly read the words of the service.

For almost four centuries this beautiful ceremony was performed every year and many different boats were made to be used for it. Always, however, the boats were named the "Bucentaur."

As a final step, the class wrote original poems about any phase of ships or ship-building that they chose. The results exceeded expectations, especially in the distinctly ethical content embodied in such an attempt as the following. Such a "moral" had never in any way been pointed out or mentioned in class.

For us the steel is glowing,
For us the ribs are bent,
For us are hammers plying,
For us are labors spent.

The builder in his office
With master mind does plan
But every little labor counts
Down to the lowest man.

Many rather long rhymed stories of ships and wrecks and building were composed, but more pleasing than any of them was this little four-line production.

If you were but a fairy,
And could grant me wishes three,
I'd choose to be an architect
Of ships that sail the sea.

Last of all came Kipling's story of "The Ship That Found Herself." The children, already familiar with his "007," were rejoiced to know that he had written a ship story too. It was read to them by the teacher during the last two days of the twelve-weeks' period over which this unit of English work had extended. They seemed to enjoy every word of it.

When the unit of work was over, the children realized only that they had found out some very interesting things about ships and ship-building, and that they wanted and intended to know more. The adult onlooker knew, however, that training in oral composition, in writing stories, both reproduced and original, in oral reading, in proper use of a library, in letter-writing, in spelling and dictionary work, and in outlining and organizing of material had been given them as well as a knowledge of some of the world's mightiest carriers, and a glimpse of one of her greatest industries.

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DRILL IN MULTIPLICATION

I have found it advantageous to substitute for drill in the multiplication tables a series of problems. These problems can be prepared rapidly and in great numbers in the following way. The

method also has the advantage of giving complete drill in all the combinations.

The selection of the multiplier is dictated by the steps previously developed. Two's and three's having been developed, the multiplier may be 2, or 3, or, if two-place multiplying be known, 23. Four's having been developed, and multiplication by three places known, the multiplier can be 234, or 432, or 423, or 324. A multiplicand is then selected as follows: 369—. Successively around the school I give out to replace the dash the figures 1, 2, 3, 4, etc., up to 9. The first child's multiplicand, then will read 3691; the second child's, 3692; the third child's, 3693, etc., a condition that alters the result of each child's example and so puts each child on his own resources. His neighbor cannot help him and he finds the necessity of doing his own work.

Quickly working the first example, I add the multiplier to the product and get the answer to the second example. Adding the multiplier to that answer gives the answer to the third example, and so on.

This is the device partially worked out:

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  3691
   432
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  7382
 11073
14764
------
1594512     First child's answer.
   432
------
1594944     Second child's answer.
   432
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1595376     Third child's answer, and so on.
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The facility with which each child can be given a separate example and be immediately examined is the feature that recommends the device for at least examination.

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WASHINGTON, D.C.

A COURSE IN AGRICULTURE

Many schools are introducing, at the present time, instruction in agriculture. The course of study in this subject is sufficiently experimental to justify the distribution of information regarding

possible lines of work which can be taken up in this course. The following statement issued in Springfield, Missouri, gives so complete an account of a possible course in agriculture that it is here reproduced in full.

E. A. Cockefair, Greene County farm adviser in co-operation with County Superintendent J. R. Reberts, has written a course of study which includes each month of the year. It will be printed in pamphlet form and distributed to students.

Sowing crimson clover, sweet clover, winter oats, alfalfa, and vetch should be done the first two weeks of September. Plots of ground on the school grounds, four feet square, should be dug for these experimental beds. Winter wheat, rye, Durum wheat, speltz, timothy, and orchard grass can be sown the third and fourth weeks in September. These are a few of the facts the children will learn. For advanced pupils, uses of fertilizers, including nitrates, acid phosphates, ground rock, potash, ashes, and lime, will be studied. Demonstrations of treatment of wheat for smut are suggested. A bushel of wheat can be taken to school, placed in a loose burlap bag, and immersed for ten or fifteen minutes in a solution in a barrel or tub, then spread to dry.

Study of acreage and yield of hay, grain, and pasture crops for the school district, with location of fields and reports of yields, set out on maps of the district, is part of the September course. These maps afterward can be displayed at the annual county show in December contests.

October is the month of seed-corn selection. Visits of the students to fields, with lessons in marking the stalks carrying the best ears will be made on Friday of the last quarter. Some of the older students may be interested in obtaining fair exhibits.

Corn-judging from samples furnished by pupils will be part of the studies in November. Planting of tulip bulbs will be taught. The older pupils and high-school students will be instructed in a tree nursery. A strip of ground twenty feet long will be prepared, and seeds from the wild cherry, walnut, butternut, hickory, pecan, chestnut, white oak, black oak, and ash of the forest trees, and apple, plum, apricot, and peach of the fruit trees will be planted. Girls of the school can interest themselves in planting roses, lilacs, barberry, and other shrubs.

Stock-judging is scheduled for December. A horse and a cow will be taken to the grounds for expert judging as to points. The children will go to a neighboring pen to judge swine. Purchase of a filt and care of it and its increase until January, 1916, is suggested for the boys. Girls will be taught to interest themselves in cows and poultry. Stock-feeding will be a theme for January lessons and visits will be made to pens. Reports on feeding balanced rations will be made to the schools. Statistics as to number of head of stock produced the last year, value and average price per head, must be recorded. Milk records for cow-testing will be taken from home by pupils.

The first pruning lesson will be given in February. Pupils will be asked to practice on grapevines and apple and peach trees at home and to submit reports. Examination of seeds for impurities will be a part of the study for that month.

Seed-testing of oats and treatment of potatoes for scab will be done in March. A contest in growing potatoes on vacant lots will probably be started and prizes given for the best crop.

Planting flowers and improvement of school yards will be done in April. Stimulation of the growing of prize acres of corn for the annual county contest will be featured this month. Growing tomatoes, with lessons on canning, for the girls, also will be featured. Popcorn- and peanut- growing will be taught. Adviser Cockefair believes the parents and pupils should join in Arbor Day exercises, planting trees and shrubbery.

Summer cultivation and care of live stock on summer pasture will be included in the May studies. Instruction on siloes and cost of their construction, and methods of combating drouth and maintaining feed and water for live stock, will close the year's studies.

Penmanship Recommendations

New York City is about to improve the penmanship of its school children. It would be interesting to record the number of new systems of writing that have been introduced in American schools in recent years. The explanation of these frequent experiments in penmanship is undoubtedly to be found in the fact that penmanship furnishes one of the most concrete examples of the success or failure of teaching. Since the problem is one which commands the attention of many teachers in different parts of the country, it is interesting to note the recommendations which have been officially sent out as the basis for the new system. The *Globe* of New York City summarizes on August 24 the official pamphlet which is to go to teachers as follows:

MATERIALS AND POSITION

a) Pupils should be trained to be discriminating in their choice of writing materials. The best results can be secured only by the use of proper equipment.

b) Penholders with metal tips should be avoided. Pupils using such holders are likely to grip them too firmly, making it impossible to relax the muscles sufficiently to develop freedom of movement.

c) Pens should be of the style commonly called "business pens," with a medium point and slight flexibility.

d) Ink should be of a quality that flows freely and makes a strong, clear line when first used.

e) Paper should be of a quality that will present a smooth writing surface and of a texture that will not permit ink to pass through it.

f) Charts, showing the approved letter-forms, should be placed in each room, in order that a distinct image of each letter shall be indelibly impressed upon the mind.

g) Each pupil should be provided with an appropriate copy showing the exact size of the writing required.

Proper position at the desk should be insisted upon at all times by the teachers to obtain the best possible results. The rules for position are as follows:

a) What is known as the "front position" at the desk should be taken. If this is impossible, the pupil may sit with the right side toward the desk, but it should be avoided, if possible.

b) The feet should rest upon the floor, the body inclining slightly forward at the hips, holding the back straight.

c) The hands should rest in a comfortable position, with the wrists turned slightly to the right.

d) The penholder should be held against the second finger, with the first finger on top and the thumb well curved pressing the penholder against the two fingers.

e) The point of the pen should be at least one inch from the end of the first finger. The top of the penholder should be held near the large knuckle of the first finger.

f) The paper should lie so that the right arm crosses the ruled lines at right angles.

The paper should be so placed that it will be convenient to swing the pen along the writing line, using the muscular rest as a pivotal point.

MOVEMENT

a) Movement drills are logically divided into general and specific; the general movement drills being of a nature to develop effective power in action, while the specific drills lead directly to letter-forms. Proper preparation for the presentation of any letter-form implies the use of both classes of drills. The rate of speed used in movement drills should be the same as that used in actual writing. Pupils should not be given the impression that movement drills should be executed rapidly, and that writing should be done slowly.

b) Each lesson should be introduced by a brief drill upon the oval- and straight-line exercises, which should be followed by practice upon a specific movement drill preparatory to the lesson proper.

c) Movement drills may be considered to be of four forms:

1. The general movement drill, such as the oval- and straight-line exercises.
2. A letter used as a drill, such as a group of small *o*'s joined.

3. A word movement drill, such as the word "mine" being repeated several times.

4. A sentence movement drill, such as "Nine men are now mining in a new mine."

d) While the use of muscular movement is paramount, drill on movement exercises alone must not be carried to an extreme.

e) The requirements of motivation demand that the usefulness of each movement exercise be shown, whether it be general or specific.

f) As the writing muscles are located in the arm, shoulder, and back, the exercises at first should be very large. As control is developed, the size may be diminished until it reaches the letter size. No attempt should be made to apply muscular movement to a letter-form until the movement drill from which the letter is generated has been mastered.

g) Little time need be devoted to the larger movement drills after the learner has acquired sufficient skill to make the smaller ones, as skill in executing the one-spaced or half-spaced movement exercises implies skill in executing the larger ones.

h) Until pupils have acquired a fair degree of control and a light, elastic touch, oval- and straight-line exercises should not be made very compact. The rule should be to let each down-stroke pass just to the right of a preceding down-stroke. The rate of speed on the simple drills should be about three down-strokes per second.

i) The amount of time devoted to movement drills exclusively in each lesson will depend upon the progress made by the class. Until a satisfactory degree of freedom and ease has been developed a large portion of the time should be used for movement drills exclusively.

LETTER-FORMS

a) While legibility is generally of first importance, yet greater success will come from the writing drills if the teacher develops: first, ease in writing; second, rapidity; and third, legibility.

b) Whenever legibility is represented as the chief essential, failure is sure to result.

c) Letter-forms acquired slowly lose their identity under speed pressure, scribbling being the invariable result.