ALISTIC TEACHING
— OF —
GEOGRAPHY

WILLIAM JOLLY, F.R.S.E.
F.G.S.

THE

REALISTIC TEACHING

OF

GEOGRAPHY

ITS PRINCIPLES
ESPECIALLY IN REGARD TO INITIATORY NOTIONS
THE CORRECTION OF PREVALENT ERRORS
AND EXAMPLES
OF SIMPLE DEMONSTRATIVE AND DRAMATIC METHODS.

BY

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PREFACE.

This little book is an expansion of a lecture given in Edinburgh on July 9th, 1886, one of a course delivered under the auspices of the Scottish Geographical Society, and published in the *Scottish Geographical Magazine*. It is produced, by request, in this more available form, in the hope that it may help teachers to more educative results in this most attractive but much abused subject. The different points treated have been more briefly indicated than fully elaborated; but this will be sufficient for the earnest men addressed. The methods advocated are available in any school, being inexpensive and homely, while, it is hoped, effective and interesting.

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ON THE REALISTIC TEACHING OF GEOGRAPHY.

FEW subjects are less skilfully taught in our schools than Geography; nay, as a whole, along with History, it would not be far wrong to say that it is the worst taught of common subjects. It is usually traversed with the greatest care and even hard work, but it is made, in general, a painful process of mere memory grind, with the minimum of intelligence. As remarked by Fitch,[1] it is often most ostentatiously offered to the examiner when the teaching is weakest in intellectual training, and it is a favourite subject with mechanical teachers.

It is generally deemed easy to teach, like its abused companion, History. In reality, it is not easy—nay, it is difficult to do really well; the elements of misconception by the pupils are so numerous and so great, and the temptations to the misuse of memory are so strong Rightly taught, there is no more valuable, informing, or fascinating study; nor any one more pleasantly and highly intellectual.

As a trainer of the reasoning powers, it may be made of the greatest service. In this aspect, Fitch has over-pressed its character of belonging to mere fact-lore. In a sense, on such a theme, the facts are primary, as urged by Fitch, and the mental training secondary; but the

[1] *Lectures on Teaching*, by J. G. Fitch.

two should never be disassociated. Skilfully treated, intelligence can always be brought to bear more or less on the facts, either in themselves, their causes, their results, and their relations, or in the manner in which they are educationally reached in the course of learning.

Reform in the teaching of Geography is urgently needed, in text-book, apparatus, and method. It should be released from the bondage of the over-burdened statistical school-book, and redeemed from the fact-lore to the rational field. Grind should be minimized, memory subordinated, and the whole teaching interfused with renovating interest and intelligence.

There are recently apparent most encouraging signs of reform, more perhaps than in most scholastic subjects. It is well and wise that our Geographical Societies should have taken up so vigorously its teaching, for there lurks the seat of the disease they wish to cure.[1]

It is the special aim of this work to show how Realism, as opposed to Verbalism, may be made to pervade all teaching of Geography; to point out prevalent errors in its treatment; and to exemplify shortly certain illustrative and dramatic methods, demonstrative at once to eye and mind, which are both simple and cheap, and, therefore, easily at command in the poorest schools.

[1] See an important paper and discussion "On the Scope and Methods of Geography" in the *Proceedings of the Royal Geographical Society*, for March, 1887; and papers in the *Scottish Geographical Magazine*, especially for 1886.

PART FIRST.

Realistic Teaching in Relation to Prevalent Defective Methods in Geography.

As in all good teaching, our aim here should be the grasping of realities, as against the conning of mere words; accuracy, in contrast to looseness; clearness, as opposed to vagueness; intelligence, instead of grind.

I.—Realities *v.* Words.

The greatest evil in teaching Geography is the over-use and abuse of Verbal Memory, the glib but empty employment of words without any real knowledge of the things they represent. Every examination furnishes abundant illustration. Pupils will speak of "coarse linen," and yet know nothing of what it is, nor be able to name examples; nay, often will they tell you that "coarse linen" is "jute," both being associated with the same town on the Tay. So on all through—the *word* given, the *thing* little or not known and still less realized.

1. *See that the Things are taught as well as the Words.*—Show to the children the substances and objects spoken of, in all possible cases. As Rousseau tells us, "Things themselves are the best explanations." Exhibit the productions talked about, pictures of the animals, the peoples, the scenes, and the rest—and materials are, happily, now abundant and cheap—and show these to all the classes, even to the highest. It is wrong to think that such

object lessons should be confined only to the lower classes.

2. *Use the Map in all teaching of Locality.*—Such a counsel would seem to outsiders to be quite unnecessary, and the use of the map to be universal. It is far from being so. It is common, in reporting, to have to say that memory work has been abundant and laborious, while the map has been little or not at all known! I have had to do so hundreds of times, and had again to repeat it last week. It is very usual to hear lists of capes, mountains, rivers, and towns asked, and given with painfully thoughtless tripping off the tongue; and not one of them indicated on the map. "Enumerate the capes on the East Coast of Scotland." "Give all the towns engaged in tweed manufacture." These and similar empty inventories you get parrot-wise repeated, and none of them pointed out! Incredible, but true. It surely requires neither explanation nor urging to see that every place-name used by the pupils should be pointed out by them on the map.

II.—Realities *v.* Errors.

The amount of misconception in the minds of pupils is perhaps greater in Geography than in most other subjects; it is certainly much more than is generally thought, as daily exhibited to careful examiners bent on realism. For example:—

1. *Regarding the lines on maps.*—These are often thought by children to be real objects on the earth's surface. I thought so myself as a boy for many a day. I once asked a class how I was to get my ship across the great black line of the Equator, for there was no way

round. The answer was a revelation of much of what geographical teaching is. "Lift it up, sir, and go below it!" promptly shouted a smart little lad, suiting the action to the words with his two hands. The true nature of these lines, as existing only on maps for measurement purposes, should be carefully explained.

2. *Regarding the real character of a map.*—The most curious ideas are entertained by children on this point, as may at any time be discovered by questioning them on the subject. Its relation to a picture, and the meaning of the different marks used for different features, should be fully explained; and care should be taken, by cross-examination, to make sure that they are *really* understood.

See, for instance, that the pupils do not think that mountains are a species of long centipedes wriggling across the map, as many a child has done; or that the different counties and countries are really coloured in nature as they are on the map; or that their boundaries are to be seen marked on the ground, and along rivers and mountain tops, as they observe them done on the map; and so on in numerous but prevalent errors.

3. *Regarding the real directions on a map.*—The north many pupils think is *up*. They cannot help it, unless the subject is properly taught; and this common mistake is by no means confined to lower classes. Yesterday, I heard a teacher ask his boys to tell him "the highest cape on the West Coast of Scotland," meaning thereby the most northerly—Cape Wrath.

4. *Regarding the real directions in nature as compared with those on a map.*—Often, where the directions are known *on the map*, their relation to the school-room and the country round is too little taught. How seldom

does an examiner find a class able to point out which side of the school-room is north and which south; or how a person could discover the north and south during the day in a place he did not know. Yet surely such elementary notions, which can be simply taught and easily understood, should be known by every child. They are generally unknown.

5. *Regarding the possibility of our living on a round globe.*—The pupils see the globe called the earth either on a stand or on the walls; and their inquisitive minds are in active wonderment how men can stick on to the world with heads upside down; how the water does not run off its surface; and a hundred like difficulties, forced on them by the globular representations in school continually staring them in the face. Most of us can recall such infantine problems, and even later ones of gravest difficulty, presented to the young philosophers, and attempted to be solved in vain. Error and misconception are here rampant in schools.

We begin the teaching of the globe and the shape of the earth far too early, and have little realized the extreme difficulty to young minds that attends this subject at every point. In no part of Geography is reform more urgently called for than here; in having these notions postponed for some years till they have some chance of being truly comprehended by children. Of this, again.

And so on with many other things that might be mentioned, in the broad geographical field.

III.—Realities *v.* Vague and Inaccurate Notions.

1. *In loose description of localities.*—One daily hears that such and such a place is "in Inverness-shire," "in

Argyll," "on the east coast," "in the south of Scotland," "in the eastern hemisphere," "in America," and the like; instead of a precise notation of its position, which it is one of the aims of good geographical teaching to secure. The teacher should be satisfied with nothing short of perfect accuracy, by tongue and pointer.

2. *In loose pointing out on the map.*—It is the commonest thing to see pointed out the *name* of a town, a cape, or mountain, instead of the very place itself; to have the name of a river or its mouth shown, instead of having the river traced from source to mouth, which alone is satisfactory; and so on and so on. A facetious but practical colleague of mine used to draw attention to this common absurdity—when he saw a boy point, say, to the *name* of Aberdeen as printed on the German Ocean, —by suddenly calling out: "Oots, tak' care, man, or ye'll get drooned oot there!" And it is a pity both teachers and pupils don't get a sousing every time they take such liberties with facts, to keep them from such errors.

It is insufficiently realized by teachers, and it is much less practised by pupils, that there are necessarily *three* kinds of pointing out on the map—those of

(i.) *The point*, as in towns, capes, peaks;

(ii.) *The line*, as in rivers, coasts, mountains;

(iii.) *The superficies*, as in boundaries, lakes, seas. Each species has, of course, its own style of pointing out on the map, and each should be carefully discriminated and rigidly exacted. Exercises should be given on these three varieties of map pointing, with the specific purpose of discriminating them to the pupils, and securing their accurate manipulation; and special attention should be

paid to the correctness of the pointing in each case. It is simply surprising how little strict accuracy is exacted in general practice here.

3. *In loose questioning.*—It is a frequent pain to listen to such questions as these: "Any cape on the east coast?" "Any town on the Thames?" "Any mountain in the Highlands?" "Any river in Asia?" Could anything be more vicious in any subject? It is especially bad in a subject where the central idea and aim should be absolute accuracy in question and answer—a precise demand with one precise and only solution. In truth, it should be put down as a maxim in most teaching, certainly in Geography,—Banish the word "any" from all questions.

4. *In loose ideas of proportionate areas on maps.*—The different scales on which maps are made are not sufficiently explained. The result is an incredible amount of erroneous notions in regard to the relative sizes of countries, especially as the native county and country are given, for clearness, on such a large scale. These errors should be corrected by constant reference to one scale, in the maps of the world or by other means, as now given in good text-books and on good maps.

PART SECOND.

Realistic Teaching in the Initiatory Stages.

Here, as in most subjects, Initiatory notions are all-important, because affecting present and future progress and colouring all after study. If these are not absolutely clear and true, disability lurks all through the course.

I.—The Definitions.

1. *Of phenomena on the plane.*—A very effective method is to form the various features in the sight of the children, and still better with their help, *by means of water poured on the table, or on the floor, or on a board laid on the floor.* In this way, all the relations between land and water may be graphically exhibited—island, cape, peninsula, coast, isthmus, continent; sea, ocean, bay, gulf, strait, channel. *Demonstrate* the phenomena, by observing each of them; obtain the definitions from the pupils themselves, by questioning; write them on the board, and have them repeated simultaneously and singly till learned—all the while directing attention to each feature thus defined, as shown to the eye by your artificial ocean and continent. With young children, use only the simpler words and features at first, introducing gradually the more difficult.

2. *Of phenomena in relief.*—Use clay, sand, and gravel, and form the features, with the help of the pupils. It is one use of the Modelling so commendable in the Kindergarten, and is effective, interesting, and educative. By

these means, make hill, mountain, peak, range or chain, group; valley, glen; plain, table-land, desert; watershed or waterparting; highlands and lowlands. Utilize simple Etymology where possible, as explained hereafter.

3. *Of river phenomena.*—Show these by pouring water on the head of the valley of clay, and noting its course to the sea, the water on the table. In this way, create the stream or river, its source, its banks; its course, its mouth, its feeders or tributaries, and its basin; a confluence or meeting of waters, a waterfall, a delta, a firth, &c.; and lakes in its course. If the model is made in hard clay, the phenomena can be very effectively shown by pouring water on it from the rose of a watering-can in the way of rain, and noting what it proves—such as the run of water to the lower levels and to the sea, the formation of tributaries and lakes and deltas, according to the shape of the land through which the streams flow, &c.

4. *Of human arrangements.*—Countries, nations, counties; villages, towns, cities; roads, canals, railways; ports, harbours; bridges, piers, etc. These can be shown, with all the interest of a game, by means of toy houses, churches, bridges, carriages, engines, and the like; and by the use of coloured chalks and the paint brush.

The ideas thus drawn from actual things, done before and by the pupils, should also be further illustrated by picturesque diagrams of the definitions, of which there are now very good examples published. Still more important, constantly use the children's own knowledge of their neighbourhood for illustration of each definition.

The chief point is to see that the ideas they receive are real and true; and that the definitions are clearly understood, as well as learned.

II.—The Directions or Compass Points.

1. *Fix the south* by turning to the *sun* at mid-day. (*South* = the *sol*-ar or sun quarter.) From this, find all the other directions or cardinal points; first north, then east and west. It is important to correct the common error of starting with the north, which in maps and geographies has gained a fictitious importance. It is from the *sun* that we obtain all our ideas of direction in practical life; in proof of which, note the habits of country folks when determining direction and time, and of travellers in unknown lands. From the mid-day position of the sun, that is, the south, all other directions are deduced.

2. *Fix these directions in the school-room.*—Mark their names or initials on the walls, and draw them by a cross on the floor, with the appropriate letters. They are sometimes shown on the roof in schools; and in one case, at least, in Glasgow, by means of brass bars inserted in the granolite at the school threshold.

3. *Show how the top of a map is north.*—Lay the blackboard on the floor, and mark there the true directions thus found. Then place it on an easel, and show how north is put to the top; but that north does not mean up or higher than the rest, but is only put thus to be well seen and for convenience; and that all maps should really be laid on the floor in their true directions.

4. *Explain the principle of naming the other points*—by describing each by means of the two between which it lies. Thus a place between N. and E. *is both* N. and E., and is, therefore, shortly said to be N.E. So with the other middle points, N.W., S.E., etc. Later, extend this

principle to N.N.E. between N. and N.E.; and to all the others.

5. *Introduce the Compass.*—At first, reckon it as pointing true north, and explain its value and use in indicating direction. Explain its name, by showing that the directions *pass* all round the circle (as in the verb *to compass* a place). Hence that these directions are called the points of the Compass. Later on, when the reason can be understood, explain the deviation of the compass from true north, the number of degrees of deviation, and its variability.

III.—The True Idea of a Map.

The order of procedure in introducing children to the idea of a Map and onwards to general geography is matter of controversy. In most text-books and Manuals of Method, it is recommended to begin with a plan of the school-room; and from this unit, to proceed to a plan of its neighbourhood, then to the village or town, then to the parish, then to the county, then to the native country, then to the continent in which it is, and so outwards to the globe itself.[1] This looks natural and logical, but it is much too formal and logical to be soundly educational.[2]

It is open to several objections, especially in the early stages. It is difficult for a young child to conceive and follow, as its *first* attempt at map-making, the plan of the school-room; from the fact that he is himself seated inside the room, and that it is too elaborate and too

[1] See this plan recently well stated and recommended by Professor Laurie in the *Scottish Geographical Magazine* for August, 1886.

[2] See a protest by Fitch against it, as pushing a theory "to an impracticable and absurd extent."—*Lectures on Teaching*, p. 347.

large. It would be wiser, therefore, to take something smaller, which he can see before him—such as the table with two or three articles upon it, as a book and an inkstand. The all important matter here is to give him perfectly accurate notions to start with, by means quite within his grasp; and the room itself presents several mental difficulties, which the table removes. After that, proceed to a plan of the floor of the room in which he sits.

But at this point, it will be well to stop, remembering that we are teaching very young children. To carry them over the logically expanding circle of the theorist, and to ask them to understand the plan of the village, town, or city in which they live, with all its intricacies, even though these were simplified on the black-board, and then the map of the county, of which a child has no more *real* knowledge than of Central Africa, is an educational mistake, which all who seek to impart realistic notions have felt. It is much more difficult for a child to disentangle the map of a town and of a county, especially if large and inland, like Inverness or York, than of a simple outline, say of England. Enough has been gained by the plans of the table and the room; for these have introduced him successfully to the idea of a map, which is our present aim.

The initiatory course I recommend is, therefore, the following:—

1. *Draw a plan of the table.*—Do this on the black-board placed on the floor, getting the children to direct the laying down of every line. First have the table bare, and draw its outline; then place some articles on it, as the ink-bottle and books, etc., and draw these in proper shape and place on this plan. Then lift the board from

the floor to the easel, and show why this position is necessary, and its effects.

2. *Draw a plan of the school-room floor*, with its walls, doors, desks, chairs, etc.—being always guided by the pupils—first, when the board is on the floor or table, and then when it is raised to the easel.

3. *Draw a plan of "the phenomena on the plane" in the water-model used for the Definitions.*—At first, let the features modelled be few, and let these be carefully traced on the board. We are thus gradually introducing the pupils more nearly to a true map. Of course, at first, only put on the plan *the features on the flat.* Here also, first have the board on the floor or on another table; and then elevate it to be seen. Begin with the land and sea features, and then include the river and its tributaries.

4. *Insert in the plan "the phenomena in relief" of the model.*—Thus we introduce them to the need of having special marks to indicate mountains and plains, ranges, etc. Make each of these marks first on the board, then insert them on your plan; and point them out on some distinct map hanging on the wall.

5. *Distinguish between a map and a picture.*—Discriminate between the two, by showing a picture and a map of the same room or physical features. There are some good diagrams published for this purpose.

6. *Distinguish between a plan and a map.*—Show that a map is a plan with additional special marks to indicate features in relief and towns, roads, railways, etc.

7. *Insert the true directions* on the plan and map, when each is executed, by means of the usual signs; and show how the top becomes north, and so on.

8. *Show the need and way of drawing to scale* —This

should not be done at first, as introducing too many ideas at once, only a general proportion in the plan of the table and room being preserved. By and by, draw the table to scale, of say an inch to a yard; then the room to scale. Show how all maps are thus drawn to scale. At first, of course, do not use the word *scale*, but secure the idea.

9. *Show the need and nature of lines of measurement.*—Draw them on the plan of the school-room, say at each yard, both along and across. Point these out on maps, and expound their use. Explain how they exist only on maps, not on the things themselves.

10. *Draw maps of the school and its immediate neighbourhood.*—Up to this point, the maps made with the child's help, under the teacher's guidance, have all been of *things in the room* and of the room itself. Extend his ideas by making a plan of the whole school, at least of his own floor, if it is a large town school and not too difficult; then of the playground and offices; then of the *nearest* roads or streets. This will help to give him a notion of how maps of larger areas are made. But here it will be wise to stop, as maps of the town, city, and county will not add to but will confuse the clearness of the conceptions already gained; and they are much too elaborate and advanced for his present capacity.

IV.—Initiatory Lessons on the Globe.

1. *They should be postponed for some years.*—It is peculiarly difficult for a child to grasp truly the idea of a sphere or globe as that on which we live. All his notions of the possible are confounded; and, when we think of it, it cannot be otherwise. How can we stick on below the

earth with our heads upside down? How is it that the water does not run off, both above and below? These and a hundred other questions crowd on a child in looking at the globe; and the more intelligent he is, the more is he impressed and depressed by them.

Strangely, the difficulty of the subject does not seem to have been sufficiently considered by educationists. They have too readily assumed it to be plain and easy, and actually begin lessons on the earth in the Infant room by means of a globe! Such lessons should be postponed for some years, till expanded knowledge of things and some ideas of gravity and other difficult matters will prevent or lessen misconceptions, which are sure to be caused by too early or unskilful teaching here. The following notes may help the reader to realise this.

2. *They should be preceded by simple elementary lessons on the Curvature of the Earth.*—With young pupils, this subject requires to be approached and taught with great care, to prevent erroneous notions. Happily, we now possess some very good illustrations to help us, in both text-books and diagrams. *The curvature of the ocean*, as proved by the mode of the appearing and disappearing of ships, would seem to be the best way of approaching the subject. In teaching this, a very good illustration is to take a toy ship with sails, and placing it on the globe away from the class, to get them to *see* that the same phenomena are exhibited here as on the ocean. The bulge or curvature of the artificial globe that rises between them and the little ship, causes exactly similar appearances to those exhibited by real ships at sea. It follows, therefore, that our earth is similarly curved or rounded; and that, as this takes place on all parts of its surface, it

is curved equally all round—that is, it is a ball or globe or sphere.

Some of the other usual proofs should be added to this one, as the pupils are able to comprehend them; but with young children, they require to be treated skilfully to be really understood.

3. *They should be preceded by simple elementary lessons on Attraction.*—These are necessary to enable the child to conceive, as adequately as he can at the age, the manner (with reasons) in which all things on the earth's surface adhere to it; because pulled by itself towards its own centre. It is not easy to teach the subject *well and realistically* to any class, especially to a young one.

A good way to begin it is through the phenomena of the Attraction of *Cohesion*, as on a pencil dipped in water, and then of *Magnetic Attraction;* to show that bodies have the remarkable power of attracting or drawing each other. Then extend the notions thus gained to the attraction of Gravity, as affecting larger bodies like the earth, and the planets and stars.

The chief difficulty is to get the child to correct the misconceptions almost forced on him by the sight of a globe in the class-room, and by its relation to the earth itself: whereby anything placed on the *lower* surface of the artificial globe falls to the ground, that is, to the terrestrial globe, instead of towards the centre of the artificial globe. This difficulty would be best met by having, if it were possible, a globular magnet, to which would adhere light pieces of iron on all sides; thus showing to the eye the manner, and to some extent the principle, of the related terrestrial phenomena.

4. *They should be complemented by lessons on the In-*

equalities of the Earth's surface.—These should be directed to remove the child's difficulties regarding the possibility of the earth being round like a ball, while mighty mountains and deep valleys and oceans exist on its surface. These difficulties are real and great, and should be skilfully removed by various comparisons. These should give some notion of the *relative proportions of these inequalities to the globe itself*—as given in good text-books. But care should here, as everywhere, be taken, to see that the notions of the children are real and correct, and truly grasped by them—no easy task.

V.—What Elementary Geography ought to be.

1. *Teach it as a series of Object lessons.*—Of course, and decidedly, there should be no text-book, which should be banished for years as a forbidden spectre. The subject should be presented in a succession of lessons on real things, from the simplest notions to the more complex; the teacher having a well-arranged, expanding plan, though never formally obtruding it. The central aim is to make all the notions of the pupils on the subject absolutely firm, realistic, and accurate, by seeing and handling the things spoken of at every stage. The facts communicated and evoked should, of course, be suited to the age and capacity of the pupils, being at once simple, telling, interesting, and correct.

2. *Utilize the Child's Own knowledge and experience at every step.*—In this subject, above most, these are constantly available if drawn on as they ought to be. In teaching, for instance, the definitions, see that you employ, for illustration and realization in nature, the actual phenomena of the neighbourhood, known or shown, and

explained to the child. These should be made the basis and type of greater forms—the brook representing the river; the hillock, the mountain; a sloping ridge or roof, a watershed; a runnel on the road or a gutter after rain, the chief facts of a river basin; and the like. It is in the use of such homely illustrations that the skilful teacher delights, and the best knowledge is incorporated in the mind. The known near and individual should always be made to lead to the unknown distant and universal.

3. *Begin the Realistic teaching of Geography very early.*—If the idea of early Geography being simply a unified series of object lessons, governed by the principles of such lessons, were more practically realized and acted on, we should make it possible and desirable to have it one of the very earliest subjects to be taught in the Infant room; and Geography would be redeemed from most of its present lamentably bad teaching at this stage.

4. *See that all lessons are short and thoroughly conquered.*—Here, as in all early training, no lesson should exceed, at one time, fifteen or twenty minutes. It should embody one or two specific points, to be grafted into the pupils' minds; and should be thoroughly and frequently revised till it is thoroughly and permanently grasped.

5. *Move slowly but surely.*—One evil that pervades most teaching is that we proceed too fast. We attack new forts without silencing those in our rear, and thus allow ourselves to be harassed throughout by an unconquered enemy. And this is true of Infant work as much as of more advanced, and, relatively to the capacity, more so. Let every point be thoroughly mastered before another is attempted. Haste is impossible in good teaching.

6. *Graduate the technical terms used.*—All technicalities are difficult to all learners: as adults know when they begin a new subject, especially a science, which Geography truly is. Happily, there are here numerous duplicate terms, many of which are easy. Only the easier should, of course, be used for a time, till their more difficult technical equivalents are gradually introduced. For example, use "point," "nose," "head," and "headland," before "cape," or "promontory;" "neck" before "isthmus;" "a narrow" and "channel" before "strait;" "shore" before "coast;" "inlet" before "bay" or "gulf;" "table-land" before "plateau;" "water-parting" before "water-shed;" "feeder" before "tributary;" "meeting of the waters" before "junction" or "confluence;" "spring" before "source;" and so on. In fact, for a long time, the simpler vocabulary should alone be employed, till the connection between the real things and their names is firmly and intelligently established.

7. *Write on the board all the technical terms used.*—If necessary, print them; but present them both to eye and ear. Get them also copied. While repeating them, see that the pupils look at them; so that sight and sound are wedded. Thus we should teach not only Geography well, but English, and help reading and spelling.

8. *Utilize Derivation at this stage where possible.*—This can be done from the first more than may be supposed likely—always, of course, in the hands of a wise and informed teacher. Do not introduce Etymology proper, but only the simpler root words *in plain English*, where such are available. For example, show that "island" defines itself, being simply "is-land"—water-land (connected with *aqua* and its cognates, the letter *s* being an

erroneous interpolation from *isle*—but, of course, here we do not bother the child with that); and that "continent" is so named from *containing* so many countries, etc.

In a similar fashion, connect "cape" with cap; "ness" with nose; "channel" with canal; "bay" with bow; "creek" with crook; "promontory" with prominent; "belt" with a belt; "peak" with beak; "plateau" with flat and plate; "watershed" with the "shed" of the hair; "confluence" with flow; "strait" with a *stretched*, and therefore narrow, piece of india-rubber; "desert" with deserted; "lagoon" with lake; "tributary" with paying a tribute of water; "firth" with ferry; "sound" with swim; "range" with rank; "haven" with have. Many of these words should, of course, be postponed to a much later stage.

Such terms as the following explain themselves, but even the meaning of such obvious words should always be drawn attention to:—head, neck, point, bed, break-water, waterfall, banks, chain, plain, sand-bank, headland, highlands, lowlands, etc. These words are available from an early stage.

9. *Get the definitions from the Pupils.*—These should be led up to and proved, as in the demonstration of a problem. The words of *the children* should be always utilized, and made the basis, by gradual correction, of the final form; which should be learned. The definitions thus received are often striking, original, and interesting. For example, a boy was shown a large map of the Pacific, with its deep-blue, expansive sea, and with its little bits of land like specks in its midst; and the nature of these pieces of land, as connected with the water, was pointed out. When asked what an island was, his answer was at

once quaintly Irish, and quite philosophical—"An island is a portion of sea with no water into *it!*"

10. *Use diagrams for illustration*—in addition to the tangible demonstrations you give. These are now graphic, instructive, artistic, and abundant.

11. *Discard all text-books.*—Cast far from your children, with disgust, most so-called "Elementary Geographies." They are, in general, monstrous, and their compilers are educational traitors to childhood. The recipe for their manufacture seems to be this: Take an Advanced Geography, squeeze out of this poor orange all the juice, then force the child to swallow the dry remainder.

Happily, a delightful change has very recently taken place in elementary books, especially those for the New Code of 1886. A few of these are really simple, and finely illustrated. *Some* of these *might* be judiciously utilized by a good teacher, at least for their pictures; but their use in the hands of the pupils is attended with danger, under most teachers.[1]

[1] Blackie & Son's "Geographical Readers" and "Geographical Text-books," and others', have really good materials and illustrations for use at this stage.

PART THIRD.

Realistic Teaching in the Use of Maps.

I.—Deduce Geographical Facts as much as possible from Maps.

Every fact, topographical, social, and political, that can be so obtained, should be learned by a careful examination of the map, under the guidance of the teacher. In truth, it should be put down as a central principle of practice, to tell nothing, and to ask nothing to be learned from a book, that can be got by observation of the map. On the map, we have the facts and features presented to the eye in their natural relations to each other—with the aid of the faculty of locality and of their proper surroundings, physical and social, to fasten them to the memory. By skilful questioning, also, much additional and valuable matter, besides that seen by the eye, can be obtained from the children.

As I have heard my friend, Mr. John St. Clair of Newton Stewart—the best teacher of Geography I have known—wisely suggest, the text-books of the future will be greatly a series of skilful questions on the facts presented on good maps, instead of the present forbidding lists of names and statistics in books. The man that achieves such a text-book will inaugurate a new era in Geographical teaching. Mr. St. Clair should himself be the first to do it—to show its nature, prove its wisdom, and exhibit how

educative and intelligent the plan may become in good hands.

II.—Subordinate the use of the Text-book.

The text-book has been one of the chief causes of "the worst way of teaching Geography," so justly satirized and condemned by Professor Meiklejohn; it has been the curse of the subject and the scholar. Think of asking a child to learn the endless, nauseous lists there presented. And they *are* learned by mere rote in this way, more than most folks, including many teachers, would think; so much so that one is tempted to recommend that text-books should be thrown entirely aside.

True geographical teaching can only be done by the paramount use of the map and the tongue, and by the firm subordination of the text-book in the hands of the scholar.

But, in their own place, really good text-books have their uses. They are a means of revising what has thus been learned through the eye and the ear; of presenting clearly the various words used, many of these being new, difficult, and foreign; of adding facts not obtainable from the map; of furnishing illustrations of the scenes and objects spoken of, as, happily, so many of our recent Geographical Readers now abundantly do; and in other ways that might be mentioned. But it cannot be enough urged, that the map should be made the main source and means of geographical teaching, and that the book, reduced to its true level of an auxiliary, should be sparingly and wisely utilized.

III.—Discriminate Two Periods and Two Purposes in the use of Maps.

1. *In Learning facts, the map should be placed near enough to allow the pupils to read the names.*—This, of course, from the principles just explained; because they are to obtain from the map as much as possible. Hence the map used *in teaching* should have the names clearly exhibited, so as to be easily seen by the pupils. The use of *blank* maps at the *learning* stage is objectionable, as they show only the features without the names. Blank maps, especially when they exhibit the features boldly, are not, however, to be discarded at this stage. Rightly used, they may be of value in teaching. But what I contend for is, that the names of places and phenomena should be *learned* as presented *on the map*, and not from a book.

2. *In Testing knowledge, the map should be far enough distant to prevent the pupils reading the names.*—If they are able to read the names then, there is no security that they really know them. Therefore, have the map so far off that they cannot read them; or, what is much the same thing, cover the names, when you wish to see if they are truly learned. Yet I have seen many schools where the pupils were allowed to read the map all the year round, and where they broke down when they were prevented reading them at the examination! In many reports, I have had to state that the map was more or less, and sometimes altogether, unknown, while memory facts were elaborately prepared. In such cases, I have always put it, that it is not the pupils who know the Geography, but that it is the map, which is always good at the subject.

At this test stage, the value of *blank* or *skeleton maps* is very great, as they render the tests perfect and save trouble to the teacher. There are two kinds of blank maps—the one where the whole of the features and places are laid down, minus the names; and the other of black material, which can be used like a board, on which the teacher can insert these, under the dictation of the class. The latter are, of course, the better, and in every way, the more thorough tests. I have seen skeleton maps painted most effectively on common black-boards. Such board-maps can be purchased; but they can easily be made by the teacher himself, by sketching, or by pricking an old map through when fastened to the board, and afterwards painting the pricked lines.

IV.—In Teaching the Geography of a Country, present the facts to the Pupils, as far as possible, as viewed from Different Standpoints.

1. Look at a full map of an unknown country, especially one with numerous physical and political facts. How crowded and perplexing it appears even to adult eyes; and how much more must it do so to those of children! To them a map must seem a forbidding and inextricable maze, as maps have generally been made for schools, until recent reforms have improved them. Hence the wisdom of presenting these crowded facts in groups, based on a succession of "standpoints," as they are best called. Such are:—(1) The external physical features; (2) the internal physical features; (3) the chief towns; (4) the minerals; (5) the manufactures; (6) the railways; (7) the commerce; and the like.

This plan recommends itself strongly, by all the principles of good teaching. It is doing in Geography what is done in all sciences, classifying the facts and graduating their presentation to the pupils. Only, see that the full map is at last presented to them as they will have it in actual use. The knowledge and ready and accurate use of the full map are what is aimed at in the end; but we help the pupil the better to that end by disentangling the complex whole, for teaching and acquiring purposes.

There are now some very good examples of this system, which may be called "the Stand-point System" of geographical teaching—such as Ruddiman Johnston's "World Series;" and an exceedingly good, clear, and cheap combined atlas and geography by Mr. T. M. Davidson of Dundee Academy (published by Menzies), "The Geography of England and Wales from Ten Different Stand-points;" and the same of Scotland.

2. *Guard against the Abuse of Classification.*—One of the chief errors in the teaching of Geography has been over-classification; learning, from a book or otherwise, lists of capes, rivers, countries, and the like. Reform lies in presenting these features to the pupils, from the first, as much as possible in the natural groupings—physical, social, and political—in which they really exist, and by which they throw valuable light on each other, all-important in good teaching. Hence the need of teaching and examining each district and country in the light of the mutual relations of the facts to each other. All good teaching of Geography is governed by the constant aim of the teacher, to make all facts shed mutual light on each other, and to present no fact except in its connection with other facts.

A good plan, therefore, is to revise, by sailing along a river, taking a voyage along a coast, or making a journey by railway. The teaching of the railway system of a country is too much neglected. Railways are now more important than most rivers, as being, in modern life, a greater means of communication than rivers, or even the sea.

PART FOURTH.

Examples of Demonstrative and Dramatic Methods in Teaching Geography.

Dramatic illustrations should be used in the teaching of all subjects where possible; in Geography, they are very available, and this to an extent not sufficiently realized by most teachers. Happily also the most effective methods are the simplest and cheapest; the best being those carried out by the use of the plainest materials, existing in every school-room in the country, and with the help of the children themselves. Expensive Orreries and like machinery and models are not required for successful teaching; and I should myself prefer such simple means as are here described to the most expensive. Where the pupils' own assistance can be made use of, it should never be missed; as this is always intensely relished by them, and it may be made an honour and a reward to be allowed to give it. In skilful hands, all the interest of play or a game may often be infused into the teaching and examining—as is here attempted to be shown.

Really, the chief part of the apparatus requisite for all schools, in addition to good, clear maps, is a good terrestrial globe. In most cases, good teachers will be able to create the rest; but even the *globe* is not essential, though very useful.

The following methods are given merely as *examples* of how dramatic teaching might be employed with simple materials.

I.—Latitude and Longitude.

1. *The difficulty of describing Position on a Globe.*—Use a plain, unmarked sphere—a common ball or orange will do. Mark a cross upon it. Ask the pupils to describe its place. Show the impossibility of doing so, as it is. The cross is neither up nor down, right nor left, north, south, east, nor west, top, middle, nor bottom—as you have only to change the position of the globe to nullify any description of its place. Thus they vividly realize the difficulty of describing place or locality on an unmarked sphere or globe, under non-stationary conditions.

2. *Fixing Polar Points.*—Make it revolve. At once, we have two fixed points—the ends of the axis (or axle) of rotation. These are called Poles—which can be indicated by means of a wire run through the orange, round which it is made to turn. Care should be taken to see that they truly understand the realities as to axis and poles, and to discriminate between this use of the word "pole" and the common one—a most frequent source of error, or at least, bad association, in young minds. Utilize its derivation, from πόλος, a pivot, πέλειν, to move, akin to κέλλειν, to drive. These points are called north and south poles; either being either, but one being selected as north. We can now state the distance of our cross from either pole.

3. *Drawing an Equator.*—To help us to measure the distance from the poles found, we draw a line round the globe, equally distant from the poles, in the direction of the rotation. This is called an Equator, or *equal* divider. We can now see more readily whether the cross is halfway between the poles, or how far it is from that position.

4. *Finding Latitude.*—It will be better, however, to reckon the position of the cross from one thing rather than two—that is, from the equator instead of from either pole. We can thus say how far it is north or south of the equator. This is called Latitude, which means distance from the equator.

5. *Parallels of Latitude.*—To enable us to measure latitude accurately, we draw lines at regular distances, parallel to the equator. These are *Parallels* of latitude. They tell distance north or south of the equator.

6. *The difficulty of describing position East and West.*—We can now give the distance of the cross north or south of the equator, but not its position east or west. The globe revolves; so that we cannot say it is on the east or on the west side, because the west at once becomes east, and east becomes west. We must, therefore, have, as in latitude, some point, or, better, some line to count from. But latitude is reckoned from a line which was determined for us, by its equal distance from the two fixed poles of rotation. In judging as to a place being east and west, we have no *fixed* point or line. We must, therefore, choose some one line from which to count.

7. *The need of a First Meridian.*—This line may be any line, as being chosen or arbitrary, in the absence of a natural means of fixing it, as in latitude. Hence different nations have chosen different first lines of reckoning—the British, the great national observatory at Greenwich; the French, Paris; the Americans, Washington; and so on. This line, from pole to pole through this point, is named a *meridian*[1] = line of *mid-day;* because all the places along this line have mid-day at the same

[1] Corrupted by *d* becoming *r*, from the difficulty of saying *medidian*

moment—*which show.* Distance east or west of this first meridian = Longitude or length.

Explain that the words "latitude" and "longitude" were so given from the Roman notions of the size of the earth. The world as known to them was *longer* east and west than north and south; hence the one measurement was by *length*, the other by *breadth.*

All nations *must* reckon from the *same line* in latitude, that line being fixed in nature. In longitude, they vary, which is a source of difficulty, one system requiring to be translated into another. Hence the desirableness of having a *Universal First Meridian.* This is not yet generally agreed on, though the meridian of Ferro Isle has been used. Point it out and show its centrality.

8. *Meridian Lines.*—As in latitude, we measure longitude by drawing lines (or meridians) at equal distances on both sides of the first meridian. Show how these all pass through the poles, and why they cannot be called *parallels*, like the latitude lines; as they are not parallel, but narrow or converge to two points through which they all pass—the poles.

9. *Degrees of measurement.*—The distances on a circle are called *degrees*, because they proceed from each other *gradually*, by *grades*, or *steps.* Show how a circle is divided into *degrees,* that the 360° fixed on is only an arbitrary number, not necessary—for 100 in a decimal system would be better; that this number was chosen from its being divisible without a remainder by more numbers than any other, that is, by all numbers up to 12, except 7 and 11. Then make the pupils name the number of degrees in a right angle or quarter circle = 90°; in a semicircle = 180°, etc.

10. *Degrees on the Globe.*—Apply all this to the globe. Demonstrate how latitude, being from the equator to the two poles, can only be counted by a *quarter* circle or 90°; and longitude, being east and west of a central north-and-south line, can be counted by *half* a circle, 180° Show, also, how the degrees of latitude are always equal, that is, of the same length; and how degrees of longitude must vary, gradually lessening from the equator to the poles, being, in fact, merely proportional parts, not absolute measurements.

11. *Position on a Globe absolutely fixed by latitude and longitude.*—Exhibit these lines on a good globe and on a map of the hemispheres; and show how the exact position of a place is determined by the two together. Give examples and exercises in latitude and longitude; both by finding out places by their means, and by giving places to find their latitude and longitude.

II.—The Phenomena of Day and Night.

In the absence of an Orrery (some of which, however, are now cheap while effective), use a candle or lamp, or better, a lamp with a reflector; and a globe. The exposition need not here be complicated by putting the earth at its angle of $23\frac{1}{2}°$; it should be placed perpendicular.

1. *Day and Night.*—The lighted half = day; the dark half = night; the part between the two = twilight, that is, the *light between* the *light* of day and the *light* of night. Mark a chalk cross, or fasten a small piece of white paper, on the globe, and show how it passes into day and night during its rotation; taking care to move the globe from west to east. Note its position at midday and midnight. Show the place and the manner of sunrise and sunset,

the morning and the evening twilights. See that the *real nature* of all these changes is fully understood—that the sun is stationary, and that *we* pass in and out of the light and dark, which are also stationary, as caused by the sun.

2. *Hours moved.*—Put a chalk cross directly under the sun = 12 o'clock or noon.[1] From this one fact, deduce all the other hours, with graduated difficulty—first midnight or 12; then morning and evening, at half times; then forenoon and afternoon, at quarter times; then any hour. Explain fore- and after-noon; and the Latin, ante meridian, and post meridian; and their contractions A.M. and P.M. Also explain our system of counting by twelve hours, and the Italian by twenty-four hours; and our recent attempt to introduce the natural twenty-four hours' reckoning. Give exercises to the pupils, by placing a cross at any position in the circle, and getting them to tell and *prove* the hour; and *vice versâ*, by naming any hour, and asking them to turn the globe to the requisite position, and to *prove* it.

3. *Degrees moved.*—In like manner, deduce the number of degrees moved through in any given time. The whole circle = 360° = 24 hours. Give numerous exercises in degrees, asking children to tell the number of degrees moved through by you; and *vice versâ*, to turn the globe through any number of degrees you name. $\frac{360}{24} = 15°$ are moved through in one hour. 15° E. of our meridian or noon = one hour earlier, or forenoon, or A.M.; and 15° W. of it = one hour later, or afternoon, or P.M. *Vice versâ*, giving hours, ask the degrees passed.

[1] Explain that *noon* was originally the *ninth* hour, or three o'clock, but that afterwards the Church services, called nones, or noons, or nines, were changed to midday.

Then 1° of longitude = the 360th part of 24 hours or a day = 4 minutes time. New York, which is 75° W. long. = 75 × 4 = 300 minutes = 5 hours, later than our time. A telegram from Britain arrives five hours earlier than it was sent off!

Give varied exercises in time and place, in latitude and longitude, by both ways—the teacher naming time or degrees, and asking results; and *vice versâ*—till the subject is mastered.

4. *How Longitude is found at sea.*—Explain the use of a chronometer, which tells Greenwich time. The captain finds when it is noon at ship, and thus obtains the difference from Greenwich in minutes; and 4 minutes = 1°. Hence he deduces his longitude. Explain how he knows when it is east or west longitude. This is the mere application of last paragraph. Give numerous exercises on slates as above.

III.—Circles and Zones on the Globe.

Use a terrestrial globe; or better, a plain sphere or large ball, with poles and equator marked on it. Have a small table—best if it is circular; but other shape will do. In the centre of the table, mark the sun; a chalk circle with rays is best; a small round flat stone, or other flat ornament, does well. But *do not use another globe or large object for the sun*, as its size and height will confuse the demonstrations. The flat table represents the plane of the earth's orbit, with the sun in the middle; the sun can, at present, be marked in the centre, and the ellipticity of the orbit may be left out.

1. *If the earth stood vertical* before the sun, show the effects: (1) day and night equal all over the world; (2)

the sun would always shine above the equator; therefore, no variety of climate except that caused by latitude—that is, there would only be the gradual diminution of heat from torrid to frigid; (3) there would be no seasons.

2. *The Earth's Inclination and the Pole Star.*—Hold the globe at an angle of $23\frac{1}{2}°$. Be careful to explain that *the axis always points in the one absolute direction.* This may be represented by an object at one end of the room, so that the axis is always parallel to the two sides of the room. Show that this point in the heavens is practically the pole star—with reason of its name; and the effect of this, that in the rotation of the earth, the whole of the other stars seem to whirl round this one star, which seems to remain stationary; but that this is only apparent, the heavens no more turning round than the room does while the globe is whirled. Prove this by making a cross on the globe, and showing how the objects in the room, while stationary, are seen at different angles all round the circle, as the globe turns. This should be carefully demonstrated, as misconceptions are otherwise certain.

3. *The Earth's Inclination and the Tropics.*—Incline the globe at $23\frac{1}{2}°$, and prove the results by moving it round the table, noting at each point the part of the globe above which the sun is vertical. This is done by holding the globe so as to touch the edge of the table, the surface of the table showing, by where it touches the globe, the verticality of the sun's rays at each point thus touched. Start with the part of the table where the edge touches the equator, at the spring equinox, and move from west to east. Note specially, at present, only the four quadrant points, and mark where the edge of the table touches the globe at each of these points.

(1.) Start, therefore, at the left-hand side of the table, looking to the assumed pole star in the room, as settled on. There the sun's rays touch the equator. This gives rise to the *equinox*, or time of *equal night*, all over the world. Prove this fact by whirling the globe and marking crosses at different latitudes, and noting the length of the day at each. (2.) Move to the south side of the table, and show, by where the table edge touches the globe, that the sun now shines directly on the earth $23\frac{1}{2}°$ N. of the equator; and that, as the earth moves from this point, the sun's direct rays fall nearer the equator. This *turning* point is called the *Tropic*[1]—that of *Cancer*, from the sun then appearing in the star group called *Cancer*, the crab.[2] (3.) Move to the right-hand or east side of the table, where the edge of the table touches the equator again = *Equinox.* Call the equinoxes the first and second, till the Seasons are taught. (4.) Move to the north side of the table, where the edge of the table touches $23\frac{1}{2}°$ S. of the equator, and from this, moves nearer to the equator again. This is another turning or *Tropic* point, that of *Capricorn;* so called from the sun appearing in the star group of the *Horned Goat* or *Caperer.* (5.) Move onwards to our starting-point, where the sun is again above the equator.

Thus we prove the part of the earth upon which the sun shines directly down during the year, and the position of the tropics = $23\frac{1}{2}°$ north and south of the equator—the

[1] From *τρέπω*, to turn, connected with *torqueo*, to turn or twist; *trope*, a turn or figure of speech.

[2] Connect etymologically for illustration, with the disease *cancer*, which is so called from its having a centre and branches round, like a *crab* and its toes.

whole being caused by the number of the degrees of the earth's angle of inclination. Draw circles representing these tropics, and name them.

4. *The Earth's Inclination and the Polar Circles.*—Move the globe round the table in the same way, stopping specially at the same quadrant positions, and noting the circle of twilight between day and night. If the teacher does not possess or does not use a terrestrial globe, this twilight circle may be well represented by a large sheet of paper, having a circle cut out of it, of the size of the globe used. The globe being placed inside this circle, the paper is held vertically, to represent the twilight circle; but care should be taken to hold it always at right angles to the sun.

The phenomena now to be examined are those occurring at the two poles. (1.) At the first equinox, the daylight falls equally all over the globe from pole to pole. (2.) From this point to the Tropic of Cancer position, the twilight circle between day and night has gradually moved away from the North Pole till it reaches 23½° from it, when it again begins to approach it. Hence the position of the North Polar Circle, 23½° from the pole, called the *Arctic Circle*, from the star group of the Bear or *Arctos*,[1] or the *Ursine* group. (3.) From this point, it gradually approaches the pole again till it reaches it at the second equinox. Show how this circle is and must be distant from the North Pole the same number of degrees as the tropics from the equator, both arising from the same cause, the earth's inclination. (4.) Give a similar proof regarding the South Pole, demonstrating the position of the Antarctic Circle. This is easily shown

[1] ἄρκτος, a bear, connected with Latin *ursus*, a bear.

by means of the same perforated paper representing the twilight circle, during the revolution round the sun.

5. *The Zones on the globe.*—These follow as corollaries from the above. (1.) The part of the earth over which the sun shines vertically is, of course, that between the tropics. Its breadth = 23½° + 23½° = 47°. This runs like a *belt*, or *girdle* or *zone*, round the *middle* of the earth, called *Torrid* or *toasted* or hot. (2.) The parts next the poles = 23½° in breadth, or, as in the Torrid Zone, 47° from side to side—erroneously called a *zone* or belt, being really a complete circle—the *Frigid*, or freezing zone. (3.) The part between the Frigid and Torrid Zones, standing in climate between the one and the other, is the *Temperate Zone.* Its breadth = 90° minus 23½° + 23½° or 47° = 43°. (4.) There are five zones on the globe: one torrid, two temperate, and two frigid. These are really six, for the Torrid Zone is, in truth, two zones touching each other; so that we have three zones north of the equator and three south.

IV.—Seasons and Months.

A.—*With table and globe.*—Use the same table and globe in the same way; for this subject is but a sequel to the foregoing. Mark a chalk cross clearly on the position of Great Britain, or paste a white or red paper on it.

(1.) Place the earth at the position of the first equinox. There day and night are equal all over the globe, and the sun above the equator, making the climate in Britain neither hot nor cold. This is 21st of March, called the *Spring Equinox.* (2.) Move the globe round to the position of the Tropic of Cancer. The sun gradually moves north till it reaches the tropic Climate of Britain

gradually warmer = Summer. Northmost point of sun = *Solstice*, or *Solar stand*, from the sun apparently standing stationary for a little before turning south again. This occurs at one-fourth of the circle onwards, in of course one-fourth of the year, or three months more = 21st of *June*. (Though not quite accurate, it is sufficiently so for our present purpose to keep to the 21st of the months all through.) (3.) Move the globe round towards the second equinox. The sun gradually moves towards the equator again, till it reaches the *Autumn Equinox* = 21st of the third month forward = 21st of September. (4.) Move onwards towards the position of the Tropic of Capricorn. The sun now gradually moves south of the equator, and the British climate gets colder till the sun reaches its southmost point, the Tropic of Capricorn = *Winter Solstice* = 21st of December. (5.) Move round to the starting-point. The British climate gradually gets warmer as the sun wears towards the equator, at the Spring Equinox. (6.) We thus have four seasons corresponding to the quadrant or quarter positions of the sun above the earth in the tropics, during the *yearly circuit* or *annual revolution* of the earth round the sun. Note that the four positions in March, June, September, and December are the *central* places of each of the seasons; and thus roughly each season consists of each of these months, with a month on each side of it. Thus Spring = the month of March and those of February and April on each side of it, when the sun is on the equator and a month north and south of it; and so with the other seasons. (7.) Ask the pupils to point out the spaces *on the table* corresponding to each of the seasons. Draw four quadrant lines from the sun to the circumference of

the table showing these, and mark also on the table the points of the equinoxes and the solstices, the lines drawn being half-way between these points. (8.) Deduce the *place* of each of the *months* from the foregoing, for all the year—from these four quarter positions of the sun, with a month on each side of them = 12 months. Get the pupils to put the globe in its right place for any month, and to *prove it*, from reference to the equinoctial and solstitial points.

B.—*Without the table or globe.*—Draw a white circle on the floor for the sun, with a circle round it for the earth's path or orbit. Fix the four great quadrant points of equinoxes and solstices, and mark them on the floor. Ask the pupils individually to stand at the right place for any month, and *prove* its correctness; and to walk or stretch over the space for any season. Let the teacher stand also at any part of the circle, and ask, conversely, the month and the season represented. Ask the pupils in succession to stand at the places of the months till the whole twelve are filled. Ask them then in succession, but irregularly, to take the position of any month, and then to return to their places in the class; and so on, giving similar exercises in great variety. The interest of a game—the game of the Months and Seasons—may be imparted to such lessons and exercises.[1]

C.—Go over the same demonstration and exercises *regarding the Southern Hemisphere*, selecting Australia or New Zealand as the place of observation; and give similar exercises, with and without the table and globe.

[1] Effective and practical methods of exposition, very well illustrated, will be found in Professor Grove's admirable little *Primer of Astronomy* (Macmillan). These take more trouble, and cannot be *acted* by the pupils like the above.

V.—The Variations of Day and Night.

Use a candle—or, better, a strong lamp (with a reflector, if possible), casting a decided shadow—for the sun; and the same globe: the table is not required here. Place the lamp on the floor, or on a small stand high enough to light the globe, so as to be easily seen. Draw a circle on the floor for the earth's orbit. Make the globe rotate while traversing the orbit, and slope it at 23½°, keeping its axis, as before, pointing to the same part of the room. In the lesson on Britain, mark its position on the globe with white or red paper.

A.—*Regarding Great Britain.*—(1.) Place the globe at 21st March, as before. Show how day and night are equal all over the world, by means of the illuminated half of the globe as it rotates. Hence the *Spring Equinox* or *equal-night* period. (2.) Move the globe towards June. Show how the day gets longer and the nights shorter, till June 21st is reached. (3.) Move on towards September. Prove the longest day; then the gradual shortening of the day and lengthening of the night, till they are again equal at 21st September—the *Autumn Equinox.* (4.) Move on towards December. Show the gradual shortening of the day under twelve hours and the lengthening of the night over twelve hours, till 21st December is reached. (5.) Demonstrate this to be the shortest day. Move on towards March again, and show the gradual lengthening of the day and shortening of the night till they are once more equal. (6.) All this should be *exhibited to the eye*, not merely stated or questioned on, and should be shown by

repeated revolutions till it is firmly apprehended. (7.) Traverse the same ground, estimating the number of hours in light and dark, at each station of the equinoxes and solstices.

B.—*Regarding the Southern Hemisphere.*—Paste paper on—say, New Zealand, and evolve the phenomena as exhibited there, in like manner.

C.—*Regarding the Arctic Regions.*—Paste white paper over these, and note and mark with pencil the movement of the twilight circle *on it* as the globe rotates while it revolves round the year circle. Start with the Spring Equinox, and its equal day and night at the poles, as well as all over the world. Then watch and show the gradual effulgence of the polar regions in the light, till the day has no night at all, at the Summer Solstice; then the gradual extension of the night till it equals the day again, at the Autumn Equinox; then the gradual immersion of the Arctic regions in the shadow, till there is no day there, at the Winter Solstice; and then the gradual growth of day, till once more it is twelve hours long, at the Spring Equinox.

Well shown to the eye, this may be made a beautiful and effective demonstration of these phenomena, so difficult for a child unaided to conceive, and so often misunderstood even by adults. The subject requires rigorous questioning in order to be fully comprehended, but it deserves and rewards it.

D.—Do the same with the Antarctic regions. The phenomena are easily gone over, if the above are conquered.

VI.—The Phases of the Moon, and Eclipses.

1. By means of a lamp for the sun, especially with a good reflector casting a definite shadow; a globe for the earth; and a smaller globe for the moon—the various phases may not only be explained, but made clear to the eye. Nothing should be told, but all should be deduced and demonstrated.

2. By the same means, the *eclipses* can be explained. *The Eclipse of the Moon* may be shown to the eye, especially with a reflector which casts a good shadow behind the earth. The immersion of the moon in the shadow can be observed; and if the globe is of the right size, partial, total, and annular eclipses may be formed and shown.

3. When this is understood, very good exercises on the phenomena may be given by using a stationary globe for the sun, and *the boys themselves* for the earth and moon, one representing the earth, and another the moon. You ask "the earth" to stand in a certain position, and then "the moon" to place himself in any required phase; each to prove that he is right or wrong. In this exercise, use a succession of boys, rewarding any one who corrects an error made, by allowing him to come to the floor. This becomes a pleasant and instructive game, that of the Moon Phases.

PART FIFTH.

Some General Principles in the Realistic Teaching of Geography.

1. *Subordinate mere Verbal Memory, and use the other faculties as much as possible.*—Though already urged, this cannot be pressed sufficiently. Bring as many of the other faculties to your aid as you can, at every moment—the senses especially; the all-potent eye, to perceive; reasoning, to get at the facts from their causes, and lead to their effects; imagination, to picture the scenes; and so on—illuminating all by concentrated lights shed by as many of the faculties as you can bring to bear.

2. *Fasten the facts to the mind by rousing Interest in them.*—Interest, especially in a child, is to the mind what appetite is to the body. If you do not rouse the mental appetite while communicating facts, you do as much cruel harm as if you forced a child to eat without his being hungry. Interest may be roused in a hundred ways—by pictures, dramatic demonstrations, illustrations, reasonings, descriptions, stories, and the like. But it must be created, or drudgery and dulness ensue, with their unhappy and disappointing consequences. If there is any name on which no point of interest can be hung, leave it out. If there is no fact worth knowing about it, the name itself is not worth learning.

3. *Use Reasoning in all possible cases.*—This can be done much more frequently than is generally thought,

especially by those who have not tried it. In fact, Geography may be made highly intellectual training. This is all the higher if general principles are carefully explained, and all cases referred back to these. In this subject, general principles regarding the globe, and the laws that govern its movements, structure, and productions, are unusually clear, interesting, and all-embracing; and are easily capable of constant application to particular cases. Properly taught, Geography—at present the most mechanical of school lessons—may be made, in skilled hands, less mechanical than most subjects.

4. *Present nothing as an isolated fact, but only in its vital relations to other facts;* and these, if possible, greater and inclusive facts. This is a corollary from the foregoing; this relationship being obtained mostly by reasoning towards it. A bald, isolated fact is not worth knowing. Rightly viewed, no fact is thus isolated, though often the connection with general principles may not be readily perceived. Where it is not, the pupil should not be harassed with such matters. It follows that the number of such barren facts will be greater with some teachers than with others; the skilled educator discovering and being capable of leading his pupils to discover relative facts and principles where another would perceive none.

In the teaching of Mr. St. Clair, this reference to general principles was constantly employed with remarkable effect. In his higher classes, he would challenge auditors to point to any part of the globe. His scholars would then be able to describe its scenery, productions, peoples, winds, etc. etc., and to prove each statement by such reasoned reference to principles. This can be done much more easily than may appear; and, when done, it

is peculiarly pleasurable to both teacher and taught, while surprising and gratifying to onlookers.

5. *Utilize the errors made by the pupils.*—This is not by any means so much tried, in general teaching, as it should be. The errors made by the pupils during the teaching, especially the exposition, of a subject are a valuable indication to the teacher of where correction or additional explanation is required. They are an all-important means of diagnosing the minds of the pupils in regard to the matter in hand; indications of local disease, which must be attacked and cured. Do not, therefore, simply deny or contradict or neglect an error, as is too often done. Use the very error as a means of bringing the pupil and the class round to the correct view; and enable them, by skilful questioning and re-exposition, to *correct their own errors.*

6. *Use the Black-board continually.*—In Geography, it is omnipotent; in most subjects, it is indispensable. A good teacher should here be a good draughtsman; but, in any case, the chalk should seldom leave the hand.

7. *Select the Statistics used, and employ all statistics sparingly.*—Instead of making these the staple work of the class, they should be few, and mainly given as illustrating principles. The aim of the teacher, in regard to statistics, is more to guide the pupil where and how to find them in after life when required, than to burden his memory at present with their heavy and barren weight. This is all the more necessary in a subject in which statistics are so fluctuating in most of its departments. The present over-statistical grind of the subject is tor turing and depressing, and utterly destructive of vitality, intelligence, and interest.

But certain statistics are necessary. What, then, are the principles of selection, both as to amount and kind?

(1.) *Give only the chiefest facts minutely as to figures*—the highest mountains, longest rivers, largest towns, and so on. But let these be as few as you can manage with.

(2.) *Choose the less important statistics, and give these only approximately*, in round numbers; but these still fewer than the former.

(3.) *Give all statistics as proportionate parts, in fractions or multiples, of a well-known unit*—rivers, by reference to the Tay or the Clyde in Scotland, the Thames in England, the Rhine in Europe, and so on; towns, by reference to Edinburgh and Glasgow in Scotland, Paris in Europe, etc.; mountains, by reference to Ben Nevis, Mont Blanc, etc.; seas, by reference to the Mediterranean, etc.; lakes, by reference to Leman, etc.; and the like. Of course, this continual reference to a known quantity is the only sound teaching of dimension in any form or subject.

8. *Show and examine, where possible, the Real Objects spoken of*—plants, productions, minerals, etc. Hence the need of a museum in all schools—well chosen, however, for real practical teaching, and not a heterogeneous collection of curiosities. Cabinets of such objects can now be had cheap and good. In most cases, these are never used beyond the Infant-room, and in formal Object lessons. No object should be spoken of without being at once shown, examined, and conquered, if at all available.

In this connection, it is most desirable, in all large schools, especially in our great cities, that a complete list of such apparatus in objects, pictures, and maps should be drawn up, with the name of each room in

which they are kept. This list should be hung in some prominent and convenient place, for reference by the staff; and this not for Geography alone, but for all subjects requiring such illustration.

9. *Vivify Description by means of Pictures, where available* —of scenes, animals, peoples, etc. It saves a deal of trouble, to put it on its lowest level. But how vivid, clear, correct, and, in a word, how real, next to the object itself!

But even where the thing itself can be exhibited, that exhibition is often imperfect. For instance, in showing teak wood, present also a picture of the tree, and, still better, with its native scenery. Materials for this purpose are now abundant, good, and beautiful. Many recent Geographical Reading Books are a very good departure in this direction. But do more than exhibit a picture; question on it till it is fully and clearly understood.

10. *Brighten and illustrate by Readings and Stories*—from works of travel, adventure, history, biography, and the like. The good teacher utilizes a library for his pupils, and causes the old dry bones in this valley of lamentation to live, and this ancient educational desert to blossom as the rose.

11. *Employ the Etymology of Place-names as much as possible.*—These are often either remarkably descriptive or historically important, and cast interesting side lights on drier matters. Illustrations are superabundant. Baltic, the sea of the Belts that give entrance to it; Minch, Gaelic for a sleeve, from its shape—the same word taking, in French, the form La Manche, the Channel; Uisge = whisky, Celtic for water, becoming Esk, Usk, Ouse, Wash, Isis, Use, Ux, Exe, Ax, Ox, as in Oxford, etc.;

Avon, a stream, appearing alone, as Evan, An, Wan, Aisne, Inn, Inney, Aney, Seine, Vienne, Almond, etc., and compounded, in Doon, Devon, Kelvin, Annan, Leithen, Irvine, Earn, Boyne, Avignon, Verona, Amiens: and so on in innumerable and bright variety and picturesqueness, as in Snaehatten, the mountain with the snow hat.[1]

Beware, however, of apparent but wrong derivations. Woolwich, for example, is not the wool town, but the hill town; Carisbrooke has no connection with a brook, but with burg; and the like. The best guide, safe, handy, and cheap, on this subject, is Miss C. Blackie's *Etymological Geography* (Isbister & Co.), revised by Skene and Joyce, with an introduction by her brother, the Ex-professor.

In conclusion. In this subject, our central motto should be *Res non verba*—Realities not Words. From prevalent abuses, this excessive expression of a truth may be accepted, by way of revolt against the tyranny of words.

We should, however, teach *both* words and things, with the motto, *Res cum verbis*—things with words; but things, realities, being primary and ever-present. Here, as in all education, we cannot sufficiently act on Rousseau's warning counsel, happily less needed now than in his day, but still clamantly demanding attention—"I can never enough repeat it, that we make words of too much consequence; with our prating modes of teaching, we make nothing but praters." Are *we* to increase the number of praters, or of thinkers?

[1] See an interesting lecture on this subject, by Professor Meiklejohn, in the *Scottish Geographical Magazine* for Sept. 1886.