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Some Points on the Preparation of Geographic Teaching Material

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conditions it can only be partially compensated for by water-power. Improved methods of transporting and applying electricity may at some future time very largely supply the deficiency of coal. Coal is now the greatest of all imports in tonnage and controls to some extent the trade in other products. Most South American countries have passed the stage where the precious metals are the most important factors and in the future the agricultural and pastoral industries will engender more substantial progress even in the Andean countries.

SUMMARY

The Incas accumulated a large amount of precious metals which to them were of use for utensils and ornaments, but were not of so great usefulness nor valued so highly as copper. The presence of these accumulated metals and of the mines already worked, together with the newly discovered deposits, led a number of adventurers to undertake hazardous expeditions, to inflict some of the worst cruelties known to history; it caused Spain to adopt a policy of exploitation which although fruitful to the home country at the time, was harmful to the colonies and in the end disastrous to the Spanish nation. Brazil has benefited by mining and will further develop her enormous mineral resources in the future. The other countries east of the Andes have produced but few minerals and have prospects of but little mining development. But the Andean countries have been much influenced as nations and will have their policies modified in the future to a greater or less extent by mineral output; especially is this true of Peru, Bolivia, and Chile.

SOME POINTS ON THE PREPARATION OF GEOGRAPHIC TEACHING MATERIAL

By H. D. GROSE

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1: PREPARATION OF MAPS FOR DESK USE

THE fate of contour and other maps used for desk study by pupils under ordinary conditions is all too well known. Such maps speedily become soiled by finger prints and dust films; they are also liable to defacement by pencil marks, ink blots, and other marks, accidental and non-accidental. The most careful supervision usually fails to prevent this, particularly in large laboratory sections. More especially is this the case when the map serves as the basis for a written report. Pupils have an instinctive tendency, in making their study, to locate points of

reference with a pencil or pen. Many repetitions of this process render such points of reference very easy for succeeding students to find, but lend neither beauty nor teaching value to the map. An inked pen point leaves a mark not to be mistaken, even by the most innocent.

Several devices for the prevention of this result have been proposed. Plate-glass desk-tops, under which the map may be placed for study, have been used with good results. Frames, similar to picture frames, with glass or sheet celluloid cover-plates, are also in use. Transparent tissue, pasted over the face of the map with colorless mucilage, serves the purpose fairly well; it is easily removed by dampening when soiled. When classes are few and small, unprotected maps, provided with check-marks, may be assigned to individual students, with assessment of fines for defacement. But glass is rather expensive and is liable to breakage. Celluloid is expensive and easily scratched. Frames are clumsy and noisy to handle; the frequent changing of maps entails much unnecessary labor. The fine system is conducive to ill-feeling and evasions of honor. Meanwhile the unprotected map goes its merry way slowly but surely to defacement and the scrap-heap.

It is a common and valuable practice to prepare maps for class-room service by backing them with muslin. This is a time-consuming and costly operation which cannot be often repeated when, as is usually the case, the appropriation for equipment is small. The common result is the prolonged use of maps which, from much handling, are both unsightly and unsanitary.

COATING MAPS WITH WHITE SHELLAC

A simple device obviates all of these difficulties. While the maps are still upon the mounting-board, and after they have become bone-dry, they may be varnished with a light coat of white shellac. The varnish should be thin enough to spread readily without showing brush streaks. With a soft brush of moderate width this operation may be quickly and easily performed. If profile lines or other reference marks are desired upon the maps, they should be located before the varnish is applied.

The varnish coat is quite resistant to abrasion by pen and pencil point. It does not take pencil marks readily. It is water proof and thus prevents ink blots from reaching the map face. When the varnished map becomes soiled it may be quickly restored to cleanliness by means of a soft dampened cloth or sponge.

Ordinary varnishes are not advisable for this purpose, as

they are too liable to crackling, which renders the map illegible. Moreover, they dry slowly, and tend to penetrate the body of the paper, causing an untidy appearance through streaking. Most disagreeable of all, they darken rapidly, adding to the difficulty of reading the map. Thin, white shellac varnish is free from all of these objections.

The teacher who has the wholesome penchant for making wall maps, graphs, and diagrams, will find the above an efficient means of greatly prolonging their usefulness. In the final trimming of cloth backed maps, it will be found that rounding the corners with the shears or a die will add to the appearance of the map and will in large measure prevent the tendency of the map to strip from the cloth backing.

2: ENLARGED MAPS

In the introductory work with contour maps, it is frequently desirable to have for general discussion a large wall copy of the map upon which the study is based. So far as the writer is aware, such maps are not published; and they would probably be too expensive for general use if commercially available. Where photographic apparatus and a stereopticon are at hand, they may be easily made as follows:

- (a) Prepare a process-plate of the desired map.
- (b) Project this with the stereopticon upon bromide paper and develop in the usual way as per directions which accompany each package of paper.
- (c) Mount the bromide enlargement in the manner customarily employed in mounting maps.

In practice, it is usually inconvenient, with the equipment ordinarily available, to secure a satisfactory enlargement of an entire contour map at one operation. It is better to prepare four or more negatives, each covering a corresponding fraction of the map. This will insure greater sharpness throughout the whole finished map, and obviate the difficulties encountered in manipulating large sheets of photographic paper. Needless to say, the several negatives should be of uniform density and size—conditions which the photographer of ordinary skill will easily know how to secure. If regular bromide enlarging apparatus is available, the results will be none the less satisfactory. Trays large enough for the manipulation of photographic paper of suitable size are generally not at hand. They may be easily provided by constructing a wooden tray of suitable depth—three or four inches—and appropriate length and width, lining the same with cheap white oil-cloth. A still better practice is to construct a tray with tight joints and paint it, both inside and out, with two

or three coats of hot paraffine, heavy shellac varnish, or better still, with the "tray enamel" to be secured from the larger photographic supply houses. Care should be taken to fill all cracks and joints thoroughly with the coating material.

By the photographic process above described, enlarged detail sections may be prepared, to facilitate the presentation of particular problems involved in the study of the map. Such enlargements of harbor maps, of mountain passes and other physiographic details playing so important a part in the control of human activities, are of especial value in commercial geography and history classes when the stereopticon is not available, or when it is desirable to have such material for some time on display for students' individual study.

3: LANTERN SLIDES

The use of lantern slides is so well known that it would seem unnecessary to more than point out the value of adding to the collection a series of prints from the negatives prepared for the above purposes. But the recent perfection of inexpensive high power incandescent lamps for the stereopticon, utilizing the ordinary lamp service, has almost revolutionized the use of the lantern in the class room. With this equipment available, the stereopticon need no longer be the thing of occasional use when time can be found or made especially for that purpose, but the desk stereopticon becomes the ever-ready means of instantly illuminating the subject under discussion. With the slides at hand, a turn of the switch button throws the illustration on the screen the moment it is needed. The slide no longer remains a teaching luxury, it becomes a teaching staple of increased value because of its ready availability. Hence the addition of such slides as indicated above is all the more desirable. Diagram slides of great variety and value may be easily prepared by tracing the desired figures with a fine pen and India ink upon glass plates of lantern-slide size. The method has been described in full in a previous number of the *Journal of Geography*.^{*} To facilitate the use and increase the value of the slide collection, a systematized storage plan is all essential. From the standpoint of flexibility and accessibility none better than the box unit system has as yet appeared.[†]

4: DUPLICATION OF SPECIAL MATERIAL FOR STUDENT'S USE

There are many maps, diagrams, and pictures whose teach-

^{*} Vol. VIII, pp. 135-136.

[†] William Herbert Hobbs. The Use of Lantern Views with Science Lectures, *Journal of Geography*, Vol. VII, pp. 180-186.

ing value would be very great if only they were readily available. Unfortunately, such material is too often buried in bulky reports or in books not readily accessible when needed. The obvious means of utilizing it is the preparation of a lantern slide copy of the desired figure.

It is occasionally highly desirable to provide each student with a copy of some particular graphic material. Such copies, of desirable size, may be prepared in any number, as per the suggestion at 2 above, from the process plate negative from which the slide is made. For the sake of rapid and convenient printing, the preparation of a 5 x 7, or larger, process-plate negative will be advantageous, since in producing a large series of prints the direct printing process is far speedier than the projection method. Any of the several developing papers now on the market will be found convenient for this purpose. The use of a matt surface paper will permit the coloring of maps thus prepared with either crayon or water color.

5: PREPARATION OF OUTLINE BASE MAPS

While there are several series of such maps commercially available, they are rather expensive in proportion to their value, they are often of unsuitable size, and frequently the desired base map is absent from the series. There are two good methods of producing such maps on a large scale: (1) by means of the hectograph, (2) by means of the mimeograph. The former apparatus is described below. The latter is now so commonly a part of the office equipment of the school, and its use is so simple and satisfactory, both as to quantity and quality of results, that it should be preferred whenever available. The procedure is as follows:

- (a) Lay the blank stencil upon the map whose reproduction is desired, securing it in place by means of thumb-tacks, paper clips, or other device to insure permanent register.
- (b) Trace in the outline with the stylus in accordance with the directions provided with that instrument.

A little practice will enable the production of highly satisfactory maps and diagrams by this method. Once the stencil has been prepared, as many copies as needed may be made. The recently introduced Dermatype stencil is especially suitable for this purpose, since it may be cleaned and filed away for future use after the first run has been secured, thus making the production of outline maps by this method very inexpensive indeed.

In tracing the outlines upon the stencil, it will be found help-

ful to work by transmitted light, particularly when working with the Dermatype stencil which, unfortunately, is at present a tinted product, a serious disadvantage in tracing from colored maps. Several devices for securing transmitted light will suggest themselves. A convenient one is an inclined frame similar to the retouching rack, but larger. The design of this may be secured by a visit to a local photographic studio. Perhaps the simplest and least expensive to prepare consists of a good-sized box, open at the top, with an incandescent electric light bulb inside. Lay a sheet of ground glass over the opening, place the map and stencil upon the glass, switch on the light, and the apparatus is ready for use. In the absence of ground glass a sheet of white tissue paper pasted upon the under side of a sheet of plain glass will be found a good substitute. Incidentally, the above device makes an admirable printing machine for gas light photographic paper.

6: PREPARATION OF THE HECTOGRAPH

Where the mimeograph is unavailable, the hectograph may be used to good advantage. There are many forms of this device upon the market, usually at prices too high in proportion to value received. The hectograph is not difficult of construction, and may be made in any size desired by the user.

Hectographs are of two general types, kaolin and gelatine. Either type is good. The latter is somewhat more satisfactory, though less easily prepared. The *modus operandi* is as follows:

(a) *Kaolin Hectograph*. Into a tray of suitable size place enough dry white kaolin to fill tray to a uniform depth of about three-fourths of an inch. Add glycerine and thoroughly incorporate until kaolin is free from lumps and is of the consistency of very stiff putty. Level off smoothly, and the apparatus is ready for use as described at c below.

Kaolin may usually be secured from the larger dealers in artists' supplies; it should cost about fifteen cents a pound. It is advisable to purchase in five-pound lots for the sake of economy in price and because of the necessity of an occasional addition to the tray to make up for losses in washing off old copy. Should the kaolin become too dry, thus reducing the number of copies obtainable, add glycerine and rework to the original consistency.

A tray 10 x 12 x 1 inches will be found convenient; it should be provided with a snugly fitting cover. The local tin-smith will be able to make such a tray at a reasonable rate.

A satisfactory levelling device is made of hardwood in the form of a T-stick, the cross arm being cylindrical with rounded ends; it should be slightly shorter than the width of the tray.

After the kaolin surface has been smoothed as well as possible by hand, lay upon it a piece of medium weight hard paper and with the T-stick rub it down to absolute smoothness. The printing bed should be releveled in like manner after each using.

When the kaolin tray is not in use, it should be covered with a thick cloth of white, non-linting goods, dampened in glycerine. The tray should be stored upside down, to prevent evaporation of glycerine.

(b) *Gelatine Hectograph.* Formulae for the gelatine hectograph are numerous, and may be found in any of several books of formulae at the public library. Pure gelatine, which is usually demanded by them, may be secured from the druggist at varying prices, usually high. A very good formula of this type was published in a recent number of the *Journal of Geography*.* Another good one is as follows:

White Gelatine (or white glue)	4 ounces
Glycerine	16 fluid ounces
Rainwater	10 fluid ounces
Carbolic Acid	a few drops

Put all together in a granite vessel and soak twelve hours or more; melt over a slow fire or in a double-boiler. When thoroughly melted, pour into a shallow metal tray (see a preceding paragraph; the present formula is designed for the tray there described); skim off bubbles with a knife or card edge, set level until cool. It is then ready for use. If the printing bed is too soft, remelt and evaporate some of the water; if too hard, causing the surface to peel or crack when in use, remelt and add a little water.

(c) *Use of the Hectograph.* The method of using the Hectograph involves the following steps:

1. Prepare the desired copy upon hard writing paper, using hectograph ink or copying pencil, and uniform pressure in tracing.
2. Wash the face of the Hectograph with a soft sponge and tepid water, applying liberally and immediately draining.
3. Soak up surplus moisture with soft absorbent paper until printing face appears dry. Newspaper is excellent for this purpose.
4. Place copy face down upon printing face, rub into thorough contact, and allow to remain five minutes or longer, depending upon number of copies desired; then remove.

* Vol. 14 (January, 1916), p. 143.

5. Quickly rub into contact with hectograph face a sheet of blank paper; remove, and repeat until the desired number of copies is obtained.
6. Wash hectograph face immediately after use with tepid water to remove all traces of old copy; it is then ready for new copy or for storage.

With the gelatine type, it is not necessary to remove old copy by washing if some time is to elapse before next use, as the ink will in time sink into the body of the hectograph. Washing is to be preferred however.

Hectograph ink may be secured from the stationer's shop, and gives the maximum number of copies, often as high as sixty or more satisfactory duplicates. Copying pencil is easier to use and usually suffices where not more than twenty copies are needed. If desired, typewritten material may be reproduced by the hectograph; the original copy should be made with the copying ribbon or with the copying-carbon paper. The latter is, if anything, even better than the ribbon for this purpose. The possessor of the Hectograph will find a host of applications for this useful device—indeed, its uses are almost without limit in variety.

All of the above suggestions have been utilized by the writer to advantage, and are passed on with the hope that they may prove equally helpful to his fellows in the profession.

A PHILIPPINE FIESTA

By HADWEN HARRY WILLIAMS
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EVERY Philippine town has annually a celebration or fiesta in honor of its patron saint, when people come from all the nearby towns to see the processions, watch the open-air theatre and enjoy the merrymaking. It is the most important holiday of the year, and no Filipino will miss a town fiesta if he can possibly help it.

For some reason the little village of Bambang up in the mountains of Northern Luzon had not had a fiesta since 1898, but lately there was one almost grand enough to make up for the eighteen years. There were to be so many events of interest that it would last for two days, so one Monday morning we sent our baggage to Bambang on packhorses, and followed on horseback when the sun had dropped behind the mountains and the air was cool. Everyone seemed to be going to the fiesta, some on foot, some