Climbing the stairs to the balcony of the Coleman Map Building, where the largest relief model of the United States is housed, carries us figuratively 700 miles above the earth. For there below us lies our country as it would look from a vantage point high in the upper stratosphere. The earth fades to a ball 165 feet in diameter. On the side nearest to us is the United States, stretching 65 feet from Maine to California and 45 feet from Michigan to Texas.

The rugged mountain landscapes and broad level lowlands, so realistically shown in plaster, demonstrate the importance of geography in the history of our country. We see the course of westward expansion dictated by geography—the shaping of transportation lines—the growth of cities—the need for canals—the fight for water and trade routes.

Minutes spent viewing this huge relief map can drive home and crystallize the thinking, discussion, and study of hours and weeks of classroom work and travel. Conjecture, approximation, and attempts to give a third dimension to regular relief maps of our country can be scrapped, for there it is—our country—its rivers, its lakes, its plains, its mountains, its valleys, and its hills, all in bold and true relief. The Coleman Map Building and the map are the property of Babson Institute and are located on the Great Map Hill at Babson Park.

**HISTORY**

In 1923 Roger W. Babson conceived the idea of constructing a Giant Relief Model of the United States. The stimulus for this
idea came after Mr. Babson had observed a map of Palestine laid out in relief on the edge of the lake at Chautauqua, New York. Mr. Babson organized a National Map Committee composed of educators and industrialists from every state in the Union. The committee was asked to guide the construction program.

Under the leadership of George W. Coleman, the first president of Babson Institute, the Coleman Map Building was erected to house the model and construction laboratories. The first work on the model was done by George Carroll Curtis, one of the leading geographic sculptors in the country. A year later, upon the death of Mr. Curtis, construction was taken over by an able engineer, E. LeRoy Nichols, who remained in charge for thirteen years. During this period came the depression of the early and middle thirties, and work on the model was placed on a part-time basis. At the end of 1937, nine-tenths of the model still remained to be constructed. The National Map Committee was reorganized with President Carl D. Smith as Chairman, Irwin K. French as Treasurer and S. Monroe Graves as Secretary. It was at this time that Dr. Wallace W. Atwood, Jr., geographer from Clark University, was put in charge of construction. A new staff entered the model laboratories. Equipment was modernized and new methods of construction were introduced. Three years later to the day, on the afternoon
of December 31, 1940, the Giant Relief Model of the United States was completed.

**GLOBE CONSTRUCTION**

The only true representation of the earth's surface is accomplished by globe construction, which permits no distortion of land area or coastal configuration. All maps or models which do not use this base are approximations. For exactness the Giant Relief Model appears as a section of a globe which, if completed, would have a diameter of 165 feet. The giant dome-shaped steel framework, reproducing in exact proportion the curvature of the earth, supports the model. This framework, 65 feet long and 15 feet wide, rests on four independent cement columns in the center of the Coleman Map Building. These independent columns support the map and are not secured to the building. In case an earthquake should shake the building the map would not be damaged.

To facilitate construction, the model was made in small blocks measuring one degree of latitude by one degree of longitude. The 1,216 blocks which make up the map are slightly curved and tapered to the north, so that they fit together along the lines of latitude and longitude.

**SELECTION OF SCALES**

To permit a generous amount of detail, a horizontal scale of four miles to the inch, or 1,250,000, was adopted for the Giant Relief Model. This is one of the standard scales used by the United States Geological Survey and has been found adequate for most map interpretation purposes.
The vertical scale of the model ranges from 6 to 12 times the horizontal. In areas of low relief, a 12-times exaggeration was used in order to bring out details in the topography, while in areas of high relief a 6-times exaggeration proved desirable because it eliminated unnatural over-exaggeration of rugged mountain country. If the horizontal and vertical scales were kept the same, Pikes Peak would rise less than one quarter of an inch above the surrounding region and the Central Lowland would appear as an almost perfect plain. Since both of these representations would be incorrect, a graded vertical scale was adopted, thus making possible a true portrayal of the relief of the country.

The best way to observe and study this map is to view it from a balcony built fifteen feet above the map. As we walk around the circular balcony we can see the buff-colored land and blue bodies of water curving before us.

Underneath the plaster blocks is a mass of wires six miles long which connect two central boards, one at each end of the balcony. On the boards are push buttons which will light the location of the capital and important cities in each state. When the switch is pushed down an orange neon light indicates the exact position of the city.

**Accuracy of Source Material**

The gathering and assembling of accurate topographic information for all sections of the country is one of the most difficult and time-consuming operations in relief model construction. To insure a high degree of accuracy, the latest available topographic maps were utilized. The chief sources of data used by the Staff of the National Map Committee include the U. S. Geological Survey, Coasts and Geo-
dic Survey, State Geological Surveys, Bureau of Air Commerce, War Department, Forest Service, Reclamation Service, railroad engineering departments, and miscellaneous reports by geologists, geographers, and other specialists. Airplane photographs were used in several instances where contour maps were entirely lacking. The Giant Relief Model combines more authentic information regarding the topography of this country than any other map or model now in existence.

Because most maps are on a flat scale, calculations for these plaster blocks had to be made by means of a very intricate process in spherical geometry to transfer the government survey maps to vellum sheets, which then may be used on plaster.

**CONSTRUCTION PROCESSES**

The first process is the preparation of a contour map on the scale of four miles to the inch, based upon the source material gathered. This map is made in sections corresponding in size to the one-degree blocks of which the model is composed. The map is then clamped onto a cardboard of specified scale thickness and an operator with a high-speed all-direction jig saw cuts out these sections indicated by the highest contour on the map. This may result in only two or three tiny holes representing the peaks of the highest mountains. Successive contours are then cut out of additional sheets of cardboard until the lowest contour level is reached.

The cardboards are then stucked and nailed, thus producing an upside-down cut-out model of the area, with the mountain peaks at the bottom. Into this skeleton is poured plaster of Paris, which hardens to produce a strange, cubist model in which the contours rise regularly and abruptly in a weird, step-like fashion. It is then the duty of the modeler, furnished with complete data on the section, to model
the topography with plasticine, introducing detail not shown by the contours and adding to the realism of the model’s appearance.

When the modeler finishes his work, the section is matched to adjacent blocks and then molded in plaster. From this mold, or negative, the final cast is produced. This receives several coats of buff paint, after which lakes and streams are painted in blue. The complete block is then placed in position on the curved base.

It is essential that each of the above processes be carried out with extreme care or the valuable detail furnished by the cartographer will be lost en route and the finished model will fail to portray an accurate picture of the topography.

**DATA AND DETAILS**

A big item in building the map was naturally the cost. The world colossus of all maps was erected in the two-story, $125,000 Coleman Map Building. The miniature map of Uncle Sam’s continental domain cost $125,000. The relief map weighs in the neighborhood of seven tons and covers an area of about 3,000 square feet. Because of wartime shortages of fuel and labor the Coleman Map Building has been closed to the public for the duration of World War II.

The large relief map was loaned to the *Boston Herald-Traveller* Book Fair which was held in the Boston Garden from October 21 to October 26, 1941. The Book Fair is a
national convention at which famous authors
tell about their works. The theme of the 1941
Book Fair was "This Is My Own, My Native
Land".

In order to move the map it had to be dis-
mantled with the 1,216 blocks packed in spe-
cially constructed boxes with not more than
eight blocks to a box. It took six men four
days to dismantle the map and pack it. Special
state police escorted the vans carrying the blocks
from the Institute to the Boston Garden. It
is estimated that 75,000 people were privileged
to view the map during the week it was at
the fair. Babson Institute has received very
favorable publicity on the contribution it made
by lending the map to the Book Fair.

The Map Building has been rebuilt in order
to provide for a huge projection machine which
will enable economic, geographical and political
material to be thrown upon the Great Map
in a most dramatic manner. This was the
original purpose Mr. Babson had in mind when
starting its construction and is the goal for
which President Smith and the Trustees are
diligently working.

PURPOSES

Mr. Babson writes of the five great pur-
poses for the Relief Map:

"The first purpose of the Great Map is to
get the nation "3rd dimension" minded. Our
millions of school children are taught about
two dimensions only. From this Great Map the
graphy, the automobile, and other maps will
be photographed, showing the hills and valleys,
ups and downs. Only then will our children
awaken to the great waste of needless grades
and dangerous hills. Every year over one-
quarter billion dollars are wasted on grades
from needlessly burning gas, oil and coal. Next
to character building, the most permanent in-
vestment of time, labor and money is in lowering
grades, building out instead of up, and
traveling on water-level routes."

"The second purpose of the Great Map is to aid
in redistributing population. This Map will
will dramatically show how people are need-
lessly crowding into a few small sections of
the country and are neglecting the great open
spaces. Yet history teaches that crowded cities
are the main cause of government corruption. World War II teaches that decentralization is the only protection against bombing planes."

"The third purpose of the Great Map is to forecast the rise and fall of cities and states by a study of drainage, rainfall, and weather."

"The fourth purpose of the Great Map is in connection with rebuilding the people's health and productive powers. President Roosevelt has recently called our attention to the fact that 50% of our young people are physically unfit. When the location of these unfit boys is shown on this Map, you can see that the cause is primarily one of location, soil conditions, and diet. The millions of boys who are suffering from bad teeth need more than dental care, they need more calcium. Yet camps themselves are being located in unnatural and unheathful localities."

"Finally, the Great Map will show the relation of climate to the character and reproductive powers of the nation."

Plans are being made to include the Relief Map as part of the educational program at Babson Institute. The model will be used in the field of business administration to portray the location of areas of economic resources such as oil, minerals, crops, forests and the relation of production centers to resources. The location of transportation systems and their relation to markets, to production centers, and to world trade routes will be shown.

It is contemplated that special lectures may be given on geographic, economic, industrial and other essential features of the United States to groups of students from other educational institutions, public school pupils, businessmen, and the general public. Over 100,000 businessmen who attend conventions in Boston each year will be given the opportunity of viewing the map and attending the lectures especially provided for them.

The model will prove of great value and interest to geologists, geographers and all students of land forms. It has already attracted many thousands of college students, scientists, and laymen. Many return over and over again to study the model in great detail.
Carl D. Smith

President of Babson Institute
To the Class of 1943:

As your two years of stay and training here at Babson Institute come to a close, may we think together briefly not upon the war and its demands upon us and our valuable time, but rather upon what can keep us going in the trying years ahead.

We all have a vital will to live. To me that will expresses itself in the desire to have a very real part in the remaking of this world so that it may be an infinitely better place in which we and our posterity may live and work. What a privilege it would be to live twice our allotted span in order that we might see what the rest of God's world is like and to have a greater part in its remaking. This will to live is the dynamo that keeps us going.

There are five great inspiring ideals by which we may direct our living in the hectic days ahead with positive knowledge that such living is counting for things most worth while. They are:

1. Live and practice definite religious principles. No man can afford to leave the dynamic force of religion out of his life.

2. Establish a gentleman's code of honor and then live strictly by that code.

3. Mindful that your education has just begun and that great leaders in all walks of life continue to be learners, set for yourself and maintain without failing standards of scholarship which shall always keep you a well informed men.

4. Irrespective of the vocational avenues into which your life finds its expression, keep always before you the fact that there exist fundamental and sterling qualities of manhood upon which the foundation of a successful career can most assuredly be established.

5. History has a way of recording the fact that great men are usually measured in terms of the honor and respect of their fellow men. Be mindful that these men have generally maintained a cosmopolitan outlook and a democratic attitude in their relationships with others.

If you and I can only approximate the attainment of these ideals, they will have proven to be good leads in the making of a better and a more successful life.

Sir Edward Beatty, famed Canadian industrialist and humanitarian, recently wrote: "Businessmen are, in a very real sense, the aristocracy of modern society. But ancient aristocracies fell. They fell because they thought too much of their privileges and too little of their duties; because they imagined that power could be transmitted by inheritance, or held by force; because they failed to gain confidence of those whom they were called to lead. If the system of economics which exists in democratic countries today should ever fail, it will be because businessmen have not fulfilled the obligations their positions place upon them."

The business world of the postwar period will need the kind of leadership for which these ideals stand and for which you have been prepared.

CARL D. SMITH, President