our country will fall behind in the great procession. Given a pressing need, and the American chemist has never been found wanting in the past, and this to my mind is abundant augury for the future.

One of the most recent triumphs of chemistry is the practical solution of that essential problem—the fixation of atmospheric nitrogen in a form that enables us to use this lazy gas in some of its very active and energetic combinations. Nature has supplied unlimited quantities of it in the air we breathe, and during eons of time has fixed some of it in such familiar substances as coal and nitrate of soda. But to man it was impossible to utilize this vast storehouse of wealth, although it was realized that in time it would be imperative that he should do so. The first partially successful attempt was by Bradley and Lovejoy in their little experimental plant at Niagara Falls. They proved that under certain conditions the nitrogen of the air could be chemically united with its oxygen. Like many another pioneer, they pointed to a fact, but could not make the knowledge lead to a financial success. Their work, however, made others think along oxidation lines made possible by electrical discoveries, and to-day Norway's remarkable hydro-electric conditions yield the world large quantities of nitrates. The oxidation of atmospheric nitrogen became therefore practicable where electric power is cheaply installed and where other uses for it are lacking. In a country like our own, with factories on all sides demanding power and willing to pay much more for it than the nitrogen industry can possibly afford, I do not see any likelihood of the successful establishment of the electric arc process here in spite of all we read about Muscle Shoals. But it is a pleasant task to state that the fixation problem was solved, even if what seemed to be a better way came later.

And what is this better way? Professor Haber and his associates found that nitrogen would unite with hydrogen, in the form of ammonia, under high pressure in the presence of that "still small voice" of chemistry, a catalyst. Ostwald found that with another catalyst, the hydrogen could be easily displaced by oxygen, making nitric acid, and there you are! These two facts made the great war certain, and extended it three years longer than it otherwise would have lasted. Professor Haber told me recently that his attention was attracted to this matter and the possibility of its solution when visiting the little plant at Niagara Falls to which I have alluded. "Behold, what a great matter a little fire kindleth."

We are not behind in this vital question in our own country. One plant has been in successful operation for more than three years, and others are starting. If, unhappily, war conditions should arise, we have the patriotic satisfaction of knowing that the materials for carrying on war are all within our own borders. This knowledge should go a long way towards preventing the necessity of thus using our resources, but it is nevertheless a pleasant thing to know that they exist.

Naturally, the peace uses of nitrogen are far more important and pressing. Peace is our usual condition, thank God! and war is a hideous excrescence which should be and will be made impossible, if not by the improvement of human nature, which is the best way, then by the advance in scientific knowledge which may mean the suicide of the race—a silly alternative.

I have briefly touched on a few of the revolutionary accomplishments of applied chemistry, during the last half century. There are many more. While the chemist can point to them all with pardonable pride, he will not, I am sure, forget the important assistance rendered by the engineer. The problems have been large enough to require all sorts of talent for their solution—another instance of the value of cooperation.

In view of what fifty years have accomplished with, at the beginning, very little knowledge shared by comparatively a few men, what may not be expected of the next fifty years with present knowledge possessed by a vast army? There is abundant room for the imagination. I will venture only one prediction. The most elaborate and delicate chemical works ever devised is the human body. Much has already been done by the chemist in delving into its secrets. Positive results have been obtained which have almost annihilated certain diseases and modified others. I predict that during the next half century, the chemist, working hand in hand with the physician, will discover the origin and nature of most of the enemies of the human body, notably that arch-enemy, cancer, and not only alleviate their effects but absolutely prevent their sinister operations. Then indeed will the human race be relieved of some of its heaviest handicaps, and be freer to progress towards the light of truth which is its principal business, for we have it on the highest authority that "the truth will make you free."

Wm. H. Nichols

New York, N. Y.

MEMBERS OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE PER MILLION OF POPULATION IN THE UNITED STATES

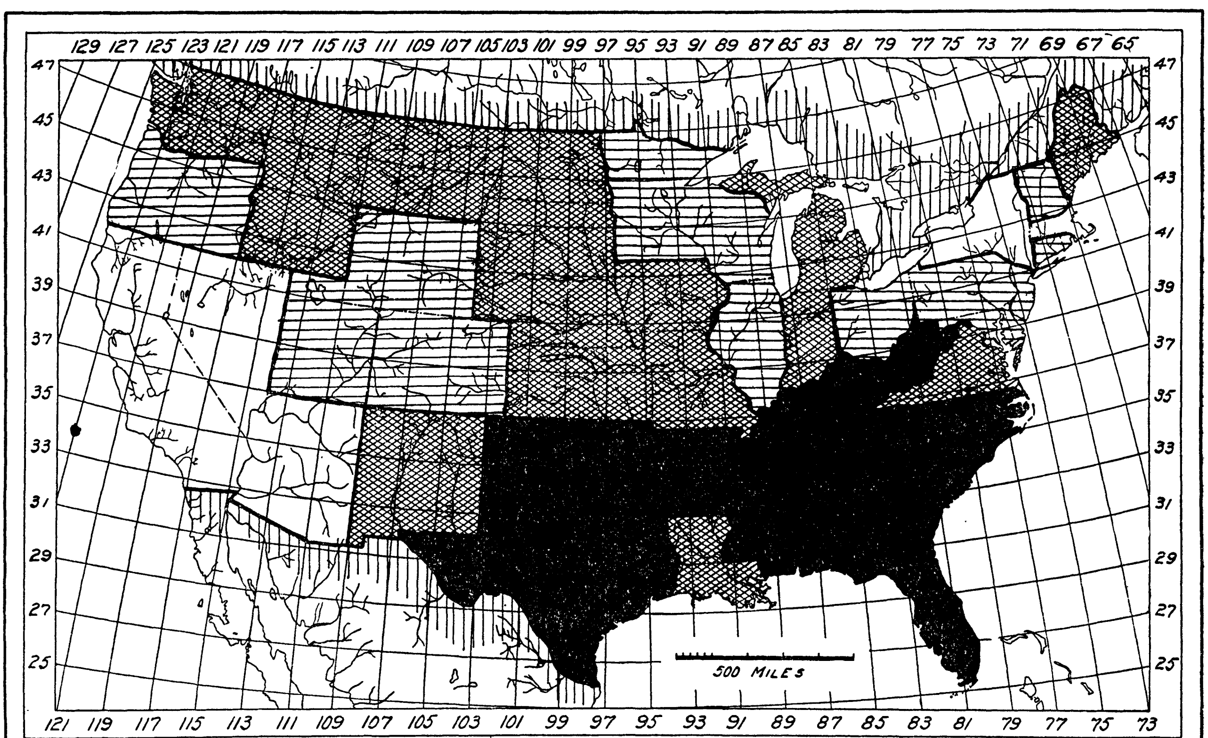
Some results of a study of the geographical distribution of the membership of the American Association for the Advancement of Science, with special reference to its relation to state populations as shown by the official Census of 1920, are of interest in connection with special efforts that are being made this year to increase the membership of the association. I have divided the association enrollment (of March 31, 1924) for each state of the United States by a number representing the state population expressed in whole millions. The resulting quotients may be called American Association membership indices. These indices are shown below, together with the corresponding state enrollment figures. They are arranged in increasing order of the index values.

Distribution of Members of the A. A. A. S.

State	Per million population	Total enrollment
Mississippi	16.8	30
Arkansas	17.7	31
Alabama	21.3	50
Tennessee	22.7	53
Georgia	27.0	78
South Carolina	28.0	47
Texas	39.0	182
North Carolina	40.3	103
Kentucky	42.2	102
West Virginia	43.0	63
Oklahoma	46.4	94
Florida	46.5	45
North Dakota	52.6	34
Alaska	54.6	3
Louisiana	59.5	107

Distribution of Members of the A. A. A. S.

State	Per million population	Total enrollment
South Dakota	59.7	38
Indiana	65.9	193
Virginia	66.3	153
New Mexico	66.7	24
Idaho	71.8	31
Montana	76.5	42
Missouri	80.2	273
Maine	84.6	65
Michigan	86.7	334
Kansas	90.3	142
Washington	91.4	124
Nebraska	91.8	119
Iowa	96.9	233
Pennsylvania	100.0	872
Minnesota	100.5	240
Oregon	102.2	80
Wyoming	103.1	20
Wisconsin	103.8	273
Ohio	111.1	640
New Jersey	112.2	354
Vermont	116.5	41
Rhode Island	129.1	78
Colorado	129.8	122
Illinois	131.7	854
New Hampshire	140.0	62
Utah	149.2	67
Delaware	174.9	39
Maryland	191.7	278



Distribution of the Members of the American Association for the Advancement of Science.

DISTRIBUTION OF MEMBERS OF THE A. A. A. S.

State	Per million population	Total enrollment
Connecticut	192.6	266
New York	208.1	2,161
Massachusetts	218.3	841
Arizona	248.5	83
Nevada	259.7	20
California	268.2	919
District of Columbia	1,383.6	606

What characteristics of our membership and of the various state populations may be disclosed by this array of figures and what may be the geographic, historical and cultural reasons for their arrangement may be left to the reader's judgment. The accompanying chart of the United States is the result of plotting the index values in four groups or ranges—*high* (unshaded), *high-medium* (horizontal hatching), *low-medium* (double hatching) and *low* (black). The District of Columbia presents a special case (with its very great association enrollment and its small population) and its membership index should not be considered as at all coordinate with the others. It is consequently left out of account in the plotting.

High membership indices (over 200 members per million of population) occur for two separated areas: (1) the area of California, Nevada and Arizona, and (2) that of New York and Massachusetts. High-medium indices (100 to 200 members per million of population) are shown for Oregon, Wyoming, Utah, Colorado, Minnesota, Wisconsin, Illinois, Ohio, Pennsylvania, Maryland, Delaware, New Jersey, Connecticut, Rhode Island, Vermont and New Hampshire. Connecticut and Maryland are almost within the high range. Low-medium indices (between 50 and 100 members per million of population) represent Alaska, Washington, Idaho, Montana, North Dakota, South Dakota, Nebraska, Kansas, New Mexico, Iowa, Missouri, Louisiana, Michigan, Indiana, Virginia and Maine. Low indices (less than 50 members per million of population) are shown for Oklahoma, Texas, Arkansas, Kentucky, West Virginia, Tennessee, Mississippi, Alabama, North Carolina, South Carolina, Georgia and Florida. At the time these calculations were made the total enrollment of the association in the United States was 11,709, which gives an average association membership index of 110.7. The average is closely approximated by the index for Ohio (111.1).

With regard to the enrollment numbers themselves (the last column of the table), only three members reside in Alaska and only 20 in Wyoming and in Nevada. The largest enrollment (2,161) is for New York, which is followed by California (919), Pennsylvania (872) and Illinois (854).

Due partly to special invitation letters sent out from the permanent secretary's office and doubtless partly to the great success of recent meetings and the increasingly representative publicity given to the association by the daily press, the membership roll has been greatly increased during the last year. At the close of the fiscal year 1922–23 (September 30, 1923) the total association enrollment was 11,704. On September 30, 1924, it was 12,887. During the fiscal year just closed there have been 121 recorded deaths among the members and 670 members are shown to have resigned or have allowed their membership to lapse by non-payment of dues for two years.

The special arrangement in celebration of the passing of the seventy-fifth year since the founding of the association, an arrangement by which any member of an affiliated organization may join the American Association for the Advancement of Science without payment of the usual five-dollar entrance fee, will remain available until next January 1.

BURTON E. LIVINGSTON

SCIENTIFIC EVENTS

NEW COLLECTION OF PALEOLITHIC MATERIAL AT THE LOGAN MUSEUM OF BELOIT COLLEGE

THE Logan Museum of Beloit College has secured, through the efforts of Mr. Alonzo W. Pond, a large collection of Paleolithic and Neolithic materials from Europe. Some of the more important portions of the collection are as follows:

Thirty-six carvings on stone from Limeuil, France. These are of the Magdalenian period and were the first portable carvings on stone to be discovered in the Paleolithic stations of Europe. Later, search was made in the débris of La Madeleine and similar work discovered. The carvings from La Madeleine and those from Limeuil are all in the National Museum at Paris except this collection now in the Logan Museum. The carvings represent the typical animals of the Magdalenian period, such as the horse, reindeer, bison and the ur. This important collection was secured through the courtesy of Dr. Frank G. Logan, of Chicago, who financed the special purchasing expedition sent out by the Logan Museum during the past summer.

In addition to the carvings on stone, the expedition obtained the well-known Didon necklace. This necklace is Aurignacian in age, and is composed of bone, stone and ivory beads from the Abri Blanchard in France. There are 143 beads, including an ivory fish pendant and four other pendants of bone. Each piece is carved from a bone or ivory baton and many are shaped like tiny baskets. They range in size from less than three millimeters in length to two or three centimeters. Each one has a hole drilled through each side with a tiny drill. The collection