the practise has been condoned for more than a century and despite the protests of conservationists tolerated during easy times of peace, it is too much to hope that it can be corrected in the strenuous days of wartime. Yet despite all excuses that are offered for the practise, pollution is *waste*. And the country will in some future day pay for to-day's bad habits and thoughtless waste.

WHAT OF THE FUTURE?

The greatest problem of the future we face to-day is not merely the winning of the war but the condition of the world at its close. The exhaustion of natural resources has proceeded at a stupendous rate. Nations have been drained of men, money and materials.

The fate of the natural resources, usually unmentioned if not unnoticed, has a profound bearing on the future of a people and on possibilities of postwar reconstruction. History furnishes many records of change in areas where once fertile lands, famous forests and abundant water supplies were the firm foundation of prosperous and highly developed national cultures. But the armies of conquerors scourged the people and laid waste the cities. It was not the slaughter of peoples that worked the final destruction, for remnants of defeated nations or new groups have at times wandered in and built new cities on the ruins of the old. Excavations on the site of ancient Troy have demonstrated that eight cities in succession were wiped out by ravaging hordes and rebuilt later on the ruins of the past.

Earlier warfare concerned itself little with the land and its natural resources, but as time went on destruction became more widespread and intimate. To-day totalitarian warfare not only destroys life and scatters the remnant of the people but makes levies on natural resources that provide for their exhaustion. The pace of destruction in Europe has already gone to an extreme which in the past has meant abject poverty for the postwar population.

In the present war the destruction in our own country is enormous, disastrous, but not annihilating. Wisdom commands not only maximum effort and devotion to promotion of the war but also obedience to the fundamental principles of conservation. To stop work inaugurated for the protection of our natural resources, to abandon well-planned measures for their conservation will open the way to unnecessary loss at the present time and leave us at the close of the conflict without organized means of guarding whatever of these resources is left for the future. The sacrifice of plans and trained leadership is both unnecessary and unwise. The foundation of conservation is biology; the bulwark of the cause is education. On teachers of biology rests the responsibility of rebuilding their courses to fit the needs of a new era. Dry-as-dust details must be eliminated; more of life, its relations, its meaning and its needs must be introduced. Courses overburdened with technical details will never train general students to be good citizens, to understand values, to fight fads or to detect political or commercial deceit. The success and permanent progress of our country must rest on well-trained and well-balanced public opinion. That can only come through the scientific attitude and good teaching.

THE NORTH AMERICAN RAGWEEDS AND THEIR OCCURRENCE IN OTHER PARTS OF THE WORLD

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THE pollens of the ragweeds (Ambrosia) are responsible for most of the so-called autumnal "hay-fever" discomforts which allergic persons in the United States experience during August and September. In the East, the giant ragweed, *Ambrosia trifida* L., and the low ragweed, *A. artemisiifolia* L., are the two species mainly responsible for these allergic troubles. Both were originally native to North America.

The flowering period of these ragweeds extends from early August into October, and farther south may even begin in late July in some instances. The author's studies, bearing on the relation of flowering to length of day, have shown that the flowering time of these plants, as in the case of many others, depends upon particular lengths of day. After the summer days have shortened sufficiently, the flower primordia are laid down, and the continued decrease in length of day as summer progresses causes anthesis of the staminate and pistillate flowers which, in the monoecious ragweeds, are borne on the same plant. In brief, these ragweeds withhold flowering until the days have shortened to their requirements, and they have been termed short-day plants for that reason.

Length of day appears to be one of the most important factors of climate concerned with the final stature and latitudinal distribution of these plants.

In latitudes where very long days prevail around the summer solstice favoring a long pre-reproductive vegetative phase of development before flowering is initiated, the plants merely increase their stature with leafy branches. When the days have finally reached the critical length for flower formation, these plants, as a result of their large size, are enabled to produce enormous quantities of pollen.

In higher latitudes, however, due to lower mean temperatures and a shorter frost-free season, a point is reached where the ragweeds can no longer fruit successfully before frost. This failure to produce seed establishes definite limits of range wherever the plants grow, whether in the region of their native home or in other cold temperate regions where they are aliens.

It is interesting to note that the ragweeds have a very sparse and precarious distribution north of latitude 50°. In North America the giant and the low ragweeds scarcely reach the Gulf of St. Lawrence, and they are not listed and apparently do not occur in the Alaskan area, most of which lies north of 55° to 60°.

These weeds have been unintentionally introduced into the British Isles and Europe many times, but they have not successfully established themselves in the British Isles, Scandinavia, Belgium, Holland and most of Germany, all of which countries lie mostly or entirely north of the parallel 50°. The principal regional and local floras of these countries either fail to mention these plants altogether or record them as mere casuals, appearing one season but failing to persist. R. L. Praeger lists no ragweeds in his flora ("Irish Topographic Botany," 1901) of Ireland, which lies between the latitudes 51° and 55° 23′ north.

In middle latitudes lying near 32° to 35°, these ragweeds appear to naturalize readily, for they are abundant in Madeira and also in Bermuda, both island groups lying near 32° north. Conditions do not appear to be especially favorable for the ragweeds in Portugal, Spain, Italy or even in France, for the more important floras either do not list them at all or report them as merely local or casual species. In Portugal and in Spain they are considered very unimportant components of the flora.

In North America, the most favorable length of day for the maximum reproduction of these plants appears to lie roughly between 45° and 30° to 35°, and these limits should also apply throughout Europe and Asia, and in similarly situated land areas in the southern hemisphere, provided such other conditions as soil moisture and temperature are also favorable.

It is now of considerable additional interest to learn the status of the ragweeds in subtropical or equatorial areas in so far as local and regional floras have revealed their occurrence here. The ragweeds do not appear to exist, or are of extremely rare occurrence, in all parts of India, Burma, the Malay Peninsula, Indo-China, China proper, the Philippines, Egypt, in North Africa and in the tropical and sub-tropical islands of the Pacific. In Australia they have been reported only from the extreme southern portion, below latitude 30° south. Low ragweed has been reported as an alien in Japan, but the locality was not given and it may be only sporadically naturalized. However, the principal islands covered by the Japanese empire lie mostly between the latitudes 32° and 45° north. On a length-of-day basis these should afford a highly favorable region for the successful naturalization of our common American ragweeds, which flourish between these latitudes in North America. There is every reason to believe that the ragweeds are of little or no importance in the flora of Oceania, comprising the islands lying between the two parallels 20° south and 20° north. Otto Degener mentions no ambrosia in his flora of the Hawaiian Islands ("Flora Hawaiiensis," 1940), these islands lying between the latitude 18° 54′ and 22° 15′ north. They do not appear to occur in New Zealand, near 40° south.

Since the American ragweeds reach northern Mexico but seem to disappear southward, and they are not reported in any of the better known Central American floras, it is indicated that these plants as they occur in the United States can not adapt themselves to tropical or equatorial conditions. Whereas the days were too long in far northern latitudes, there is reason to believe that failure to naturalize in the warm tropics is due to lengths of day that are now too short. This phase of ragweed behavior will not be discussed here, however.

On the basis of the known distribution of ragweed, its very definite autumnal flowering in response to a shortening length of day in extra-tropical latitudes, and its seeming absence in tropical regions, certain conclusions may be drawn.

In Alaska allergics will experience no trouble with ragweed pollens. In Europe north of 50° they will find little, if any, inconvenience from any of the ragweeds. In southern Europe, more especially in the warmer coastal sections and along the warmer river valleys of southern France and Italy, the ragweeds may be expected to occur, but even here they do not appear to occur with the same widespread abundance and persistence that characterize them in American fields and waste places. In practically all parts of India, China, Burma, Indo-China, the Malay States and Egypt, so far as any published lists reveal, they will find no ragweeds to bother them.

In subtropical and equatorial regions allergics should have no trouble with the temperate region rag-

weeds, and even the tropical species appear to be sparsely represented.

They should not be subjected to ragweed pollens in Oceania between the latitudes 20° N. and 20° S. This zone includes practically all the large islands of the Pacific area between Japan and Australia where fighting has been in progress since our entry into the war.

South of the equator, in southern temperate latitudes, the ragweeds appear to show a distribution in response to length of day and other factors similar to that of the north temperate zone. The flowering season, however, is now related to the south temperate summer and fall season, which occurs from December to March and April.

Even in European regions where ragweed might occur as a casual, it will be limited to very low altitudes, owing to its requirements for particular conditions of seasonal warmth. In eastern North America, and in these middle latitudes where the seasonal length of day favors its optimum success as a vigorous and abundant weed, the plant disappears near altitudes of 3,200 feet, as in the Cabin Mountains of West Virginia. It is small and a rather localized component of the flora at Davis, West Virginia, at an elevation of 3,100 feet. Temperature alone operates at these altitudes, since the summer mean temperatures are very low, the season of growth between spring and autumn frosts short, and unfavorably low temperatures are likely to occur at any time during the growing season.

While it is recognized that allergic persons are affected by the pollens of particular groups of related plants in a family, rather than by a single species, because their pollens appear to have certain irritant principles in common, the ragweeds must still be considered major offenders wherever they occur abundantly. This is recognized in the United States and in the temperate regions of South America, more especially in parts of Argentina where certain species are very abundant, and where two to three per cent. of the population is allergic from one cause or another.

From this survey of the occurrence of the ragweeds (Ambrosia), in temperate and tropical latitudes, as revealed by the principal floras of the world, it seems safe to conclude that American soldiers campaigning in most of Europe, in the tropical regions of Asia, Africa and the warm tropical islands of Oceania, lying between 20° N. and 20° S., will have little to fear from troublesome ragweed pollens, even though they may have been allergic to such in America.

OBITUARY

JAMES McGIFFERT
1868–1943

ON June 18 James McGiffert passed away at Los Angeles, a few hours after he arrived at his residence in California where he used to spend his summer vacation for many years.

Of Scotch-Irish descent McGiffert was born at Stockport, Columbia County, N. Y., and received his early training in nearby Hudson. Entering Rensselaer Polytechnic Institute in 1887 he graduated in 1891 with the degree of civil engineer. After one year of postgraduate work in mathematics at Johns Hopkins he returned to his alma mater as assistant in mathematics. Three years later he entered Harvard University, where he took the degrees of A.B. and A.M. simultaneously in 1896. Resuming his career in Troy he became assistant professor in 1900, associate professor in 1920 and in 1932 full professor in charge of graduate courses and consultant to the department of mathematics. In his early years as a teacher he published, mainly for the use of his own students, "Notes on Algebra," "Problems on Mensuration" and "Mathematical Shortcuts." His growing blindness, which deprived him of his sight completely when he was fifty, did not diminish his efforts to keep up with the times. In June, 1927, when he was approaching his sixties, Columbia University awarded him the doctorate in philosophy and in the next year McGiffert published his "Plane and Solid Analytical Geometry." Shortly before his death he wrote a brief introduction to algebra and geometry for use in defense courses. An active member of the American Mathematical Society and for years on the board of editors of the *Mathematical Magazine* he frequently lectured on mathematical and allied topics.

A staunch Presbyterian and devout churchman, he conducted for many years a class for students whom he impressed as much with his knowledge of the Bible as with his wizardry in mathematics. Outside his own field he was particularly interested in language and languages (was it not Gibbs who stated that mathematics was also a language?). A purist in the matter of language, who knew and appreciated the origin and the meaning of words, McGiffert for twenty-eight years presided over and guided the destinies of the Troy Society for Spoken English, where he acquainted his fellow-Trojans with leaders of science, literature and the pulpit.

No account of his life work could be complete without mentioning Cora Emily Medway, whom he first met in his Harvard days and married shortly afterwards. Without his "Coralie," an accomplished musician, a marvelous housewife, a never-tiring reader and (by courtesy) an assistant-mathematician, his life