

## Year 2000: Outlook for cleaning products

*The following talk was presented by Theodore E. Brenner, president of The Soap and Detergent Association, at the North Central AOCS symposium, "Fats and Oils: Looking Toward the Year 2000," held in conjunction with the dedication of AOCS headquarters early in November.*

When the invitation to speak arrived, I began thinking about the year 2000 and its significance. The date is an auspicious one, marking both the turn of the century and the millennium. The last time the millennium changed, Europe was in the Dark Ages and soaps and detergents were a nonindustry. Of course, there was some soapmaking, but clearly soap was not something familiar to the general population. The kind of widespread, popular usage of cleaning products so familiar to us is a phenomenon with roots in the Industrial Revolution, and a result of the economic, technical and social changes that it engendered.

High production and consumption levels are common mainly in the industrialized nations. However, pervasive structural changes in national economies comparable to those of the Industrial Revolution already have begun in Asia and Latin America. Likewise, structural changes are under way in the more developed nations, but their effects on consumption of cleaning products are more difficult to divine and may not always be entirely positive.

The forces behind the changes are many and varied—economic, social, political—and all working at different strengths and speeds in different places. New patterns already have emerged. Those among the most visible and with the greatest bearing on the production/consumption outlook worldwide by the year 2000 include the following:

- *Acceleration of change.* Time seems to have collapsed. The period between conceptualization, development and implementation grows shorter. The abbreviation of time span is made most apparent by the ever-increasing rapidity in which

new goods and services arrive in the marketplace. The process is worldwide, reaching into all aspects of life and generating expectations for "instant" solutions to problems and for "instant" gratification of desires.

- *Geographic diversification of manufacturing.* The world manufacturing base was centered in North America and Western Europe until two decades ago, when a large and rapid shift away from those areas to Asia and later to Latin America began.

- *The rapid transfer of technology.* The turnover of technology from developer to user is very quick worldwide. State-of-the-art production and process facilities no longer are exclusive to developed nations.

- *Restraints on population growth.* About three-fourths of the world population live in the less-developed nations. Since 1960, the average annual population growth rate in these nations was reduced from 2.3% to 2.0%, although some countries in the group, such as China, did significantly better than the average. In the more developed regions, the population average annual growth rate was cut in half during the same period, from 1.2% to .6% (1). In fact, fertility rates in most Organization for Economic Cooperation and Development (OECD) countries now are below the level required to replace the population. (2)

- *Different priorities assigned to environmental quality in different parts of the world.* High political and economic priorities are assigned to environmental quality in the developed nations. The less-developed nations devote little, if any, of their national economic resources to environmental quality

pursuits, and industry is free of the environmental compliance cost burden.

The processes creating these patterns represent primary developments that lead to higher income and lifestyle improvements in the poorer nations. In the richer nations, adverse assessments often are made of the economic benefits versus the environmental effects flowing from technology and its processes and products, including those that clean. Many of these nations also are facing the impact of shrinking populations and populations that are aging (2). The markets for cleaning products in the industrially developed nations now are mostly mature, with low growth rates and relatively stable levels of production and consumption. Any large increases in production and consumption, therefore, must be sought elsewhere and will originate from industrial expansion in developing nations.

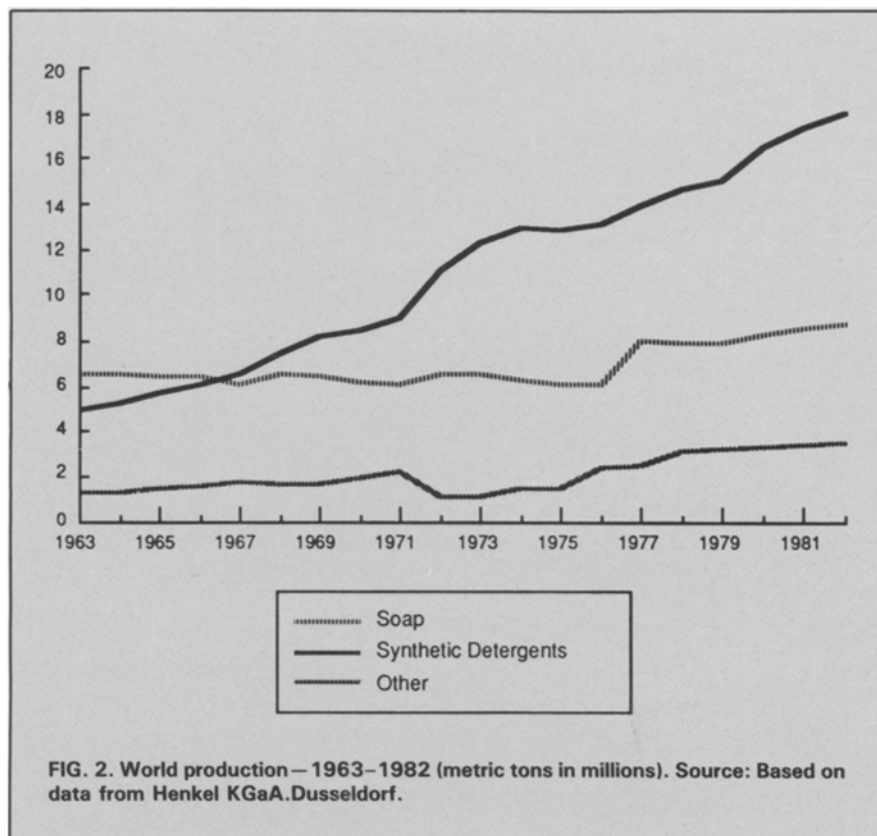
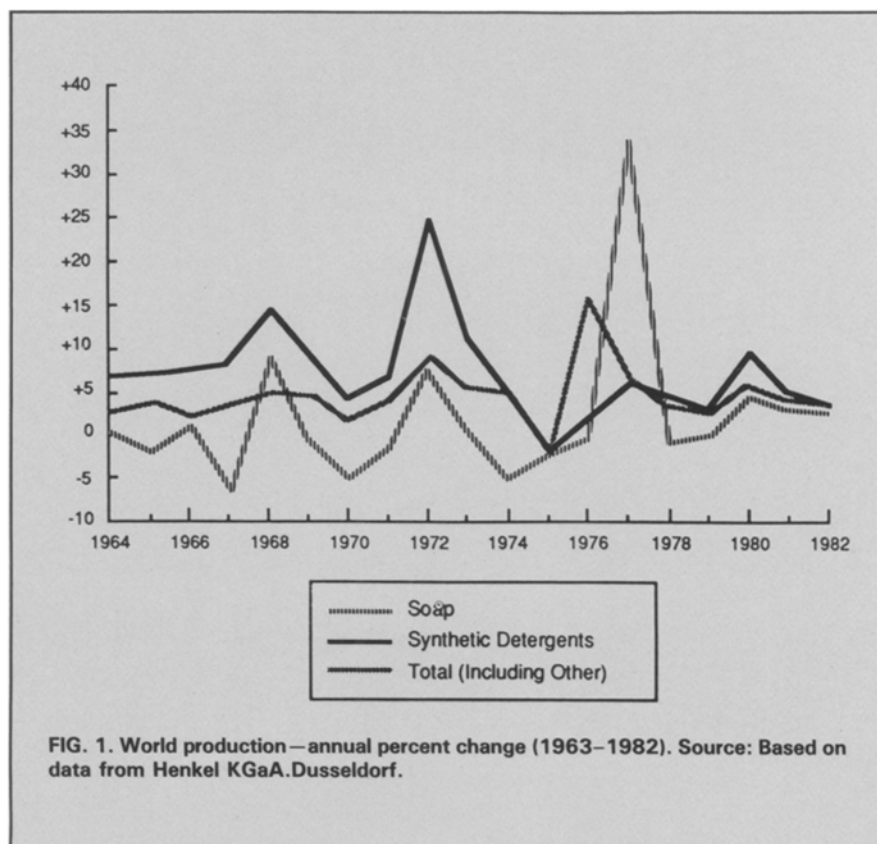
In these countries, the impact of technology on the environment generally is low on the list of national priorities, ranking far behind expanding employment and income levels. As a result, the economic conditions needed for promoting increased production and consumption of cleaning products in these places are taking firm hold. Additionally, there seem to have been alterations in popular attitudes that lead to quicker acceptance of changes in the status quo and a hardened determination to partake of the good things in life that previously had been enjoyed on a large scale only in developed nations or among the small, privileged classes. Consequently, the outlook for soaps, detergents and other cleaning products is good for the year 2000 but with geographic changes in production and consumption distribution.

The year 1982 is the latest year for which global production figures are available on a year-to-year basis, so there is an 18-year data gap until the end of the century.

Over the 20 years prior to 1982, cleaning product production displayed a sturdy vigor. Figure 1 presents percent changes annually in total worldwide production of all cleaning products and of soaps and detergents individually. The "other" component of the world total is not shown. This is a miscellaneous category that includes scouring agents and laundry auxiliaries such as fabric softeners.

In the 20-year period illustrated, the total growth rate was negative only in the year 1975, and that unexplainable negative was only a 1% decline from the previous year. The strong, steady growth over time demonstrated by cleaning products as a category is not expected to diminish by the year 2000. The average annual global growth rate for the five years that ended in 1982 was about 3%. This rate is 1-2% less than that of the two preceding five-year periods. The inherent growth momentum of the last two decades and the structural changes now going on suggest that an average annual growth of 2-3% is sustainable through the end of this century. World production of soaps, detergents and other cleaning products totaled 30 million metric tons (MT) in 1982 and is projected to fall in the range of 46-50 million MT in the year 2000. Figure 2 presents world production from 1963-1982 by component.

The individual worldwide production levels for soaps, detergents and other cleaning products do not lend themselves to close projection at this juncture, as the past may not entirely be indicative of the future. The outlook for soap, for example, may be brighter than the past 20 years would suggest. Soap production worldwide ranged between 6-6.5 million MT from the early 1960s until the late 1970s when it began registering some growth. Soap production is now over 8 million MT (3). The long decline in soap production may be halted. It should also be recalled that soap was and is the world's largest volume surfactant (3). Although it seems unlikely that soap will recapture the ground lost to synthetic detergents in the industrialized world, it now seems poised for expansion in some less-developed



countries due to the availability of suitable agricultural feedstocks, modest capital outlays for production facilities and restrictions on foreign exchange transactions.

Asia currently accounts for about 38% of world soap production. There, the relationship of soap production to synthetic detergent production is 1.34 to 1. In Africa, the relationship is 1.77 to 1. Historically, soap has been the dominant detergent, especially in developing and nearly developed countries with a low gross national product (3), and it clearly will maintain this role for some years to come. Figure 3 shows the soap to synthetic detergent production relationship for 1982 by major geographic areas.

For comparison, soap's share of total world cleaning product production in 1982 was about 29%, a little less than half the 63% it represented in 1960. A major contributor to the decline was the replacement of soap products by synthetic detergents in laundering and dishwashing applications in the industrialized nations. The replacement went on at different paces among them but usually occurred within a comparatively brief span of years. In the U.S., for example, synthetics had captured over half the laundry detergent market by 1952 following broad-scale introduction to consumers five years earlier.

Synthetic detergents for laundering and dishwashing have had a very large presence in the U.S. cleaning products market for nearly 40 years, and for almost as long in Western Europe and Japan. The transition from soaps to synthetic detergents in the industrialized nations now is virtually complete. The change happened smoothly, quickly and easily in these nations because their cleaning product consumption already was high and was supported by strong economic and consumer demand infrastructures. Building such infrastructures proceeds at different rates and is subject to national political priorities that can vary dramatically.

World production of synthetic detergents stood at 17.9 million MT in 1982. The production volume is expected to increase at a mod-

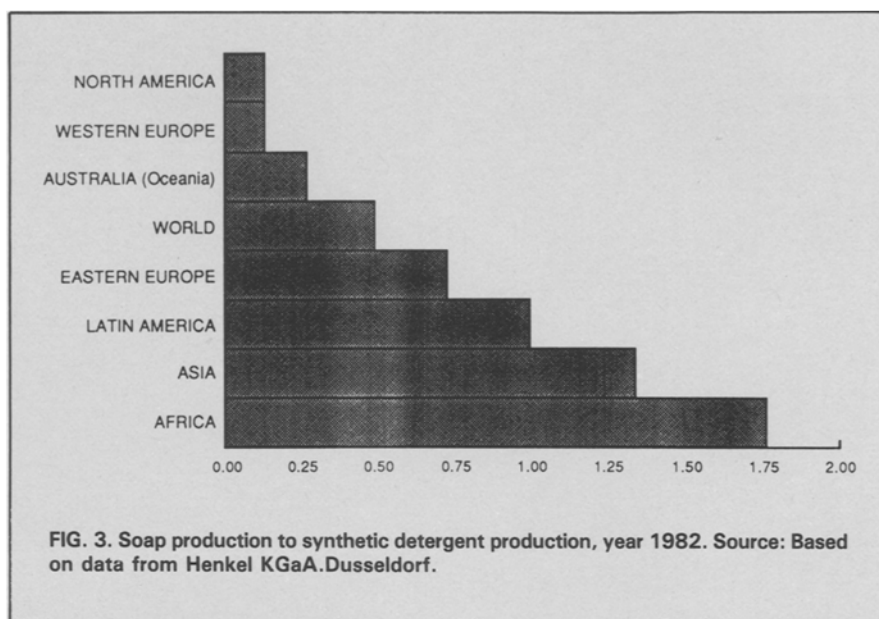


FIG. 3. Soap production to synthetic detergent production, year 1982. Source: Based on data from Henkel KGaA, Dusseldorf.

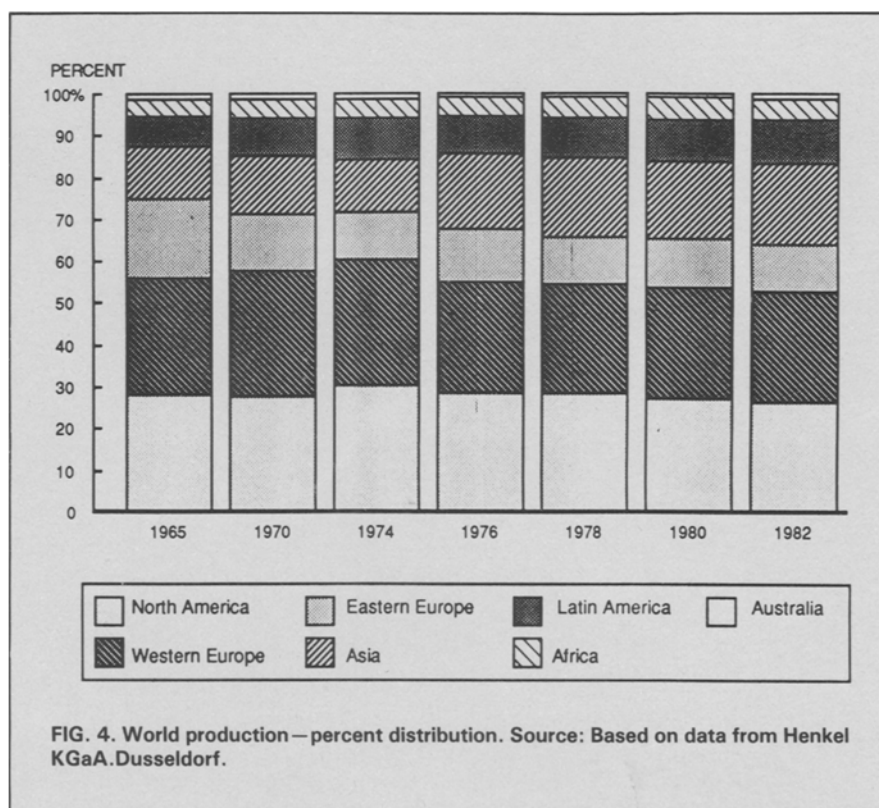


FIG. 4. World production—percent distribution. Source: Based on data from Henkel KGaA, Dusseldorf.

erate pace despite low growth rates and the shrinkage of some market segments in parts of Western Europe due to low population growth and consumer environmental consciousness (4). Synthetic detergents presently account for about 60% of total world cleaning

agent production. Interestingly, the production volume of synthetic detergents to that of soap has been roughly 2:1 over the 10-year span ending in 1982. This relationship may tilt more toward soap by the year 2000.

Western Europe and North

## Surfactants & Detergents News

America in 1982 accounted for about 63% of the global production of synthetic detergents compared with 76% ten years earlier. The replacement of soap by synthetic detergents mainly has occurred in the developed nations. Obviously, any further large annual increases in synthetic detergent production must originate elsewhere in the future, but the increases will occur only to a degree consistent with local consumer habits and practices. In Latin America, consumption of laundry detergent powders and laundry bars is rising; the current relationship between powders and bar volumes is about 1:1, essentially unchanged from five years earlier (5).

Soap is based on a surfactant of oleochemical origin derived from agricultural sources, as opposed to synthetic detergents, which are petrochemicals derived from fossil sources. Agricultural sources are renewable and expandable; fossil sources are finite. Presently, the surfactants in use worldwide for detergency are mostly petrochemical. Because fossil sources are finite, a time must come when oleochemical-based surfactants will gain ascendancy but it is not likely that this reversal will begin by the year 2000. When it comes will be determined more by the economics of petroleum than the supply of triglycerides.

The next speculation concerns the type or types of oleochemical surfactants that will prove dominant. Soap will be one type, but its deficiencies under hard water conditions and in laundering synthetic fibers suggest it will be only one of a constellation of oleochemical-based surfactants, some of which may involve as yet unknown permutations of carbon chain lengths. The selections ultimately will spring from a matrix of textiles, washing appliances and economics.

Figure 4 shows the geographic distribution of total world production of soaps, detergents and other cleaning products for selected years. Production and consumption tend to approximate each other on a continental basis although they may differ slightly on a country-by-country basis. Foreign trade is not a significant factor on a con-

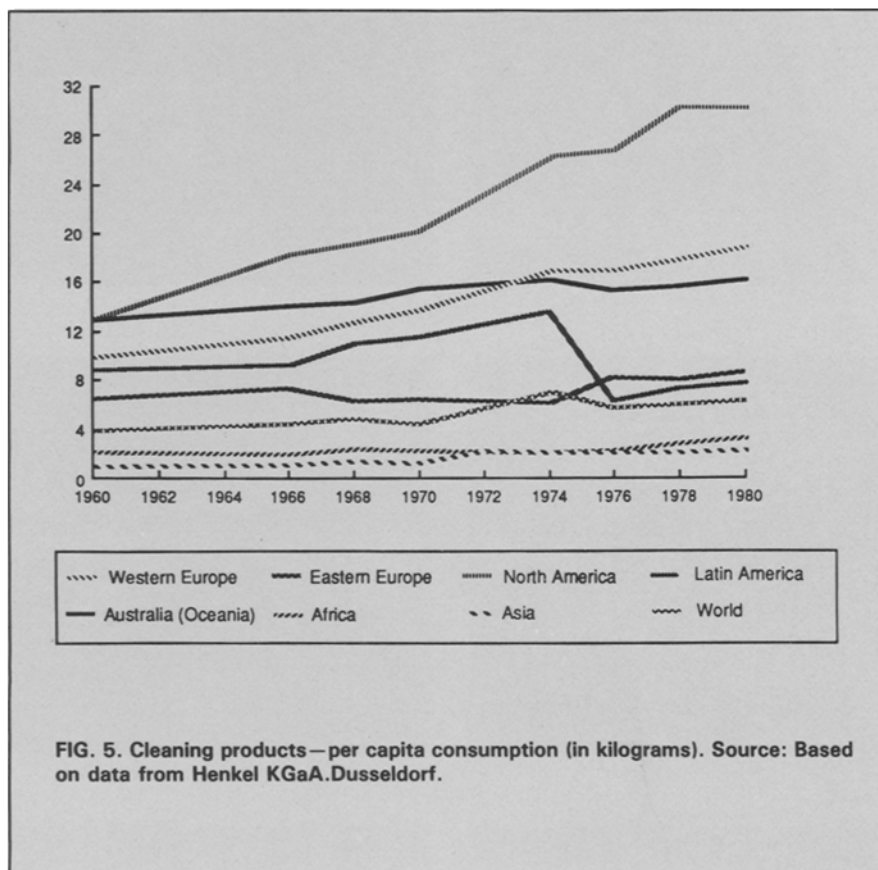


FIG. 5. Cleaning products—per capita consumption (in kilograms). Source: Based on data from Henkel KGaA, Dusseldorf.

tinental basis, nor is it usually so on a country-by-country basis. Foreign trade is not expected to be a major factor by the year 2000 because of expanding local production. Western Europe and North America accounted for about 53% of total world production of soap, synthetic detergents and other cleaning products in the year 1982, down from about 60% in the mid-1970s. It should be noted that only about 16% of world population live in these areas. These markets, being mature, are unlikely to generate future high growth rates. By the year 2000, their proportionate share of world production could fall to the 40–50% range.

Meanwhile, Asia and Latin America are expected to enlarge their shares of world production significantly, stimulated by increasing industrialization and reduced population growth rates especially in certain parts of Asia. Mainland China, for example, which now has a population of over 1 billion, or about 21% of the world

total, is successfully emphasizing the one-child family. The average annual population growth rate there dropped to 1.1% in the five years ending in 1985, slightly more than half the 1.8% for the decade that ended in 1980 (6). The reduction in the population growth rate in the less-developed regions lessens social pressure on economic and other resources and helps heighten the demand for all goods, including cleaning products.

Annual world per capita consumption of soaps, detergents and other cleaning products has been increasing steadily since 1960, climbing from 3.8 kg to 6.3 kg by 1980. Figure 5 presents per capita consumption by major geographic region. By the year 2000, world population is expected to total 6.1 billion (7). World per capita consumption levels then should range between 7.5 and 8.2 kg based on projected world production of 46–50 million MT.

Substantial increases in per capita consumption levels occurred

between 1960 and 1980 in most major geographic areas. Large increases in per capita levels were achieved in North America and Western Europe but they are not expected to be repeated on the same scale because of mature markets. Likewise, about 25% of the North American and 17% of the Western European per capita consumption levels are attributable to "other cleaning products," composed of scouring agents and laundering aids. The high proportion of "other" is an indication of extensive market development and differentiated consumer demand for auxiliary products.

In recent years, however, this demand began taking a different course, one that ultimately can affect total consumption moderately—popularity of the multifunctional laundry detergent that softens as well as cleans. The concentrated laundry detergent requiring much lower dosage levels per wash load than was common as recently as 10 years ago may ultimately have a similar effect on total consumption levels. For the per capita consumption levels of the developed regions to be sustained or increased, not only must overall consumption grow at a rate equal to or greater than the popu-

lation growth rate, but also the supply of washable articles must increase and consumer habits for cleanliness must be sustained and stimulated.

Environmental decisions on the part of the consumer already have begun to erode the cleanliness habit in some parts of Western Europe (8). In addition, the populations of North America and Western Europe are heading for higher median ages, a result of effective restraints on birthrates and extended lifespans, which may also affect consumption levels negatively. Thus, high per capita consumption in these areas appears to be at some risk. In contrast, similar upper-limit barriers to per capita consumption do not exist in the developing areas. In many of them, conditions that nurture increases in per capita consumption are being created. By the year 2000, North America and Western Europe still will retain their lead in per capita consumption of cleaning products, but the gap between them and the less-developed regions, especially Latin America and Asia, will have narrowed.

In conclusion, the year 2000 will see a vigorous cleaning products industry worldwide, expanded production and stronger market

development in the now less-developed regions, and an upper barrier to consumption in the more-developed nations imposed by unfavorable demographics and environmental concerns. The world will be a cleaner place, and, hopefully, the new millennium will usher in 1000 years of peace and enlightenment for our great planet Earth.

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## Colgate-Palmolive additions

The following report was provided by Colgate-Palmolive upon a request from Arno Cahn, who serves as JAOCS' Associate Editor for the News for Surfactants and Detergents.

Colgate-Palmolive is constructing two major additions to its Piscataway, New Jersey, technical center. The scenic eight-acre campus located along the Raritan River houses the technical organizations involved in the research and development of Colgate's worldwide personal care and household products.

The first project is a 60,000-square foot laboratory support facility, which is nearing completion. Designed to provide more efficient use of the existing labora-

tory facilities, this addition is being constructed in a central area connecting on three levels with each of the existing laboratory wings. The building is designed in a diamond configuration, with three points of the diamond connecting to existing wings and the fourth point serving as an exterior employee entrance. It will provide such laboratory support functions as special instruments, equipment, offices and sample storage facilities.

A major function of the new laboratory support building will be

to facilitate communications among the technical center staff. A key design element is an atrium located in the center of the diamond. The atrium provides an open environment for personnel to interact as they use the conference and administrative support provided nearby.

Over 180 personnel will staff the laboratory support building. Laboratory management personnel are stationed in offices around the perimeter of the building close to the laboratories they manage.

The original Piscataway facilities in 1960 were designed for a staff of 300. Over the years, many chemical research laboratory areas were used for administrative or support