In 1898, William Osler gave a presentation about angina pectoris. His statement on the rarity of this disorder in 1898 is poignant considering the frequency with which cardiovascular illness is encountered today [1]. Scholars debate what has caused a disease that was once considered a rarity to become so commonplace. It is difficult to embrace the gene theory because it is most unlikely that there has been any substantive alteration of the gene pool between the 19th, 20th, and 21st centuries. Physical activity is often touted as a major factor, yet gymnasiums and organized exercise classes were not abound in the 19th century. Similarly, it is challenging to contemplate that stress levels were significantly different in each century.

That leaves us to reflect on the most significant aspect of lifestyle, which is nutrition. While food such as meat, fish, poultry, potatoes, vegetables, and fruit have remained commonplace, the consumption of sugar-laden products, such as sugary drinks and ice cream, processed food, and cheese has increased.

After the end of World War I and into the early 1920s, the identification of cardiovascular disease accelerated and coincided with the increased availability of monounsaturated and polyunsaturated oils. In the 19th century, it was unusual to eat processed food that was preserved in a box, a bag, or a can. A common preservative used in this packaging method was processed oil.

At the same time, these oils were increasingly used for cooking at home. As the restaurant industry flourished, offering more availability and variety, the public developed a habit of eating out several times a week, exposing themselves to restaurant meals that were frequently prepared with oil. A cardiovascular disease epidemic onset seemed to coincide with the widespread exposure to oils. There is now science both in animal and human studies that indicate how oils promote vascular injury.
Tsunoda employed a high-monounsaturated oil diet in a 4-month murine study, which resulted in obesity and diabetes [2].

Rudel, in a 4-month murine study, confirmed ingestion of monounsaturated or polyunsaturated fats created atherosclerosis with each diet, albeit more with the monounsaturated oils [3].

Rudel also conducted a 5-year African green monkey study on the ingestion of monounsaturated, saturated, and polyunsaturated fats. The monounsaturated and saturated fat groups developed equivalent amounts of coronary atherosclerosis; the polyunsaturated group developed less [4].

Blankenhorn utilized 18 human subjects to examine the influence of diet on the appearance of new lesions in human coronary arteries. Each quartile of increased total fat consumption—either monounsaturated, polyunsaturated, or linoleic acid—was significantly associated with the formation of new lesions [5].

Ong studied the effects of fat and carbohydrate consumption on endothelial function in 16 men, finding that the high-carbohydrate diet increased flow-mediated dilation, which was decreased by the monounsaturated fat diet [6].

Vogel examined the postprandial effect of components of the Mediterranean diet on endothelial function, observing that meals prepared with olive oil reduced flow-mediated dilation by 31% while meals prepared with canola oil reduced it by 11% [7].

Christian Rueda-Clausen found that consumption of olive, soybean, and palm oils had a similar acute detrimental effect on endothelial function in 10 healthy young subjects. All oils resulted in an endothelial impairment of 31% and an increase in triglycerides [8].

The Lyon Diet Heart study examined the effects of a Mediterranean diet high in oil in men with heart disease. In the 4-year follow-up, 25% had sustained a major cardiac event (heart attack, stroke, or death) [9].

Table 1. Summary of oil studies and results

<table>
<thead>
<tr>
<th>Investigator</th>
<th>Subject</th>
<th>Oil</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tsunoda</td>
<td>Murine</td>
<td>Monounsaturated</td>
<td>Obesity and diabetes</td>
</tr>
<tr>
<td>Rudel</td>
<td>Murine</td>
<td>Monounsaturated or polyunsaturated</td>
<td>Atherosclerosis with both diets</td>
</tr>
<tr>
<td>Rudel</td>
<td>Monkey</td>
<td>Monounsaturated, saturated, or polyunsaturated</td>
<td>Atherosclerosis with both diets</td>
</tr>
<tr>
<td>Blankenhorn</td>
<td>Human</td>
<td>Monounsaturated, polyunsaturated, or linoleic acid</td>
<td>Atherosclerotic lesions progressed in all groups</td>
</tr>
<tr>
<td>Ong</td>
<td>Human</td>
<td>Monounsaturated</td>
<td>Decreased flow-mediated dilatation</td>
</tr>
<tr>
<td>Vogel</td>
<td>Human</td>
<td>Olive oil</td>
<td>Decreased flow-mediated dilatation</td>
</tr>
<tr>
<td>Rueda-Clausen</td>
<td>Human</td>
<td>Olive, soybean, palm oil</td>
<td>All oils created 31% endothelial impairment and increased triglycerides</td>
</tr>
<tr>
<td>DeLorgeril</td>
<td>Human</td>
<td>Mediterranean diet with oil</td>
<td>25% major cardiac events at 4 years</td>
</tr>
</tbody>
</table>

By way of contrast, with my colleagues in a study of persons with significant cardiovascular disease, we reported arrest and reversal of vascular disease. 198 participants with significant coronary artery disease were requested to follow whole food plant-based nutrition without oil. At nearly 4 years of follow up 99.4% of the 89% adherent participants had no major cardiac events (heart attack, stroke, or death) [10].

In summary converging lines of evidence indicate consumption of processed oils whether monounsaturated, polyunsaturated, or saturated contribute to endothelial dys-
function and atherosclerosis. To my knowledge there is no study with oils that has successfully reversed coronary artery disease. Studies that purport the benefits of oil indicate merely a slowing of disease progression but not halting or reversing disease. As an example, the Predimed study, which was industry supported, claimed the prevention of cardiovascular disease with the Mediterranean diet. At study onset, no selected participants had a diagnosis of cardiovascular disease. At five years of follow-up, all three diet groups had sustained scores of major cardiac events of heart attack, stroke, or death. Specifically, these events occurred in 96 participants in the olive oil group, 83 in the nut group, and 109 in the low-fat group. A more accurate title of the study would be “The Creation of Cardiovascular Disease with the Mediterranean Diet.”

Avoiding these oils enables disease arrest and reversal. Our earlier study indicated these benefits, when coupled with whole-food plant-based nutrition without oils, can be sustained beyond 12 years [11].

References