where the temperature is reduced to —183° by the same method. Air under a small pressure is cooled in the cold of the oxygen chamber and liquefies under this small pressure and runs out as a mobile, slightly bluish liquid, boiling at —190°. The advantage of such a process is the possibility of experimenting at any temperature between ordinary temperatures and —190°. Another advantage in an experimental laboratory lies in low pressures involved. The outfit is too costly and too complicated to be duplicated, however. Liquid air is a common commodity now and almost every large city has its liquid air plant. The plants of L'Air Liquide Society at Montreal, Toronto and Niagara Falls employ the Claude process. The great plants of Norway and Germany employ the Linde process, utilizing the Joule-Kelvin method of cooling, while most of the small laboratory plants employ the same method in the Hampson machine, built by the British Oxygen Company of London. There are also some small Linde machines in laboratories.

If nothing more than the liquefaction of air had been accomplished, the results are worth while, since the best method of separating nitrogen from the oxygen of the air is the process of liquefaction and separation of the components as they re-evaporate. The problem of procuring adequate supplies of nitrogen is becoming one of first rate importance. All vegetation and animal life requires nitrogen for growth. With few exceptions plants cannot take the nitrogen directly from the air, but must get it in the form of nitrates in the soil. Animals cannot take the nitrogen from the air but get it from vegetable matter for the most part. So nearly all life, while requiring nitrogen for growth, must find it in some utilizable form. Unfortunately, it is not very easy to form these compounds of nitrogen owing to the peculiar inertness of this element. Air is a mechanical mixture of nitrogen and oxygen and only under peculiar conditions do they unite to form a compound. A lightning flash does bring about a combination of these two elements which is washed down and in the earth it is transformed into a nitrate which can be utilized by the plant life. But obviously there is not very much formed in this manner. Acting on the hint given by the lightning, a practical process of making a compound of nitrogen and oxygen has been per-