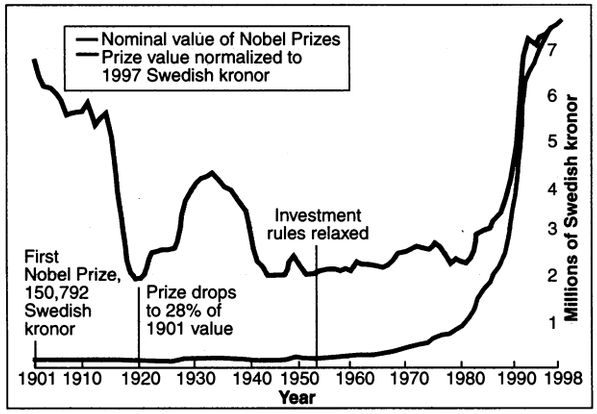
grandfather), a 26-year-old assistant to Nobel. Sohlman gathered all of Nobel's shareholdings, cash, and other financial assets quickly and in great secrecy so that he could avoid French taxes and instead have the will executed under Swedish law. On one occasion, in Paris in 1897, he rushed all over the city in an open horse-drawn cab with a loaded pistol in each pocket collecting together the Nobel fortune. The Rothschilds bank of Paris, the only institution capable of safely handling such a big fortune, transferred everything for sale to Scotland.

The sale netted 31.5 million Swedish kronor ($3.7 million), and the Nobel Foundation was created. Nobel stipulated that the foundation's money should be invested in "safe securities," which was interpreted at that time as meaning gilt-edged government bonds. But when governments began to abandon the gold standard in the 1920s, bonds could not keep up with inflation and the value of the foundation's assets began to erode. Taxes were also nibbling away at the prize money. Sweden's Parliament exempted the foundation from income tax in 1946, but by this time it was the biggest taxpayer in Stockholm. By the mid-1950s, only one-third of the original value of Nobel's legacy remained.

The foundation's fortunes began to turn around in the early 1950s, after skilled financiers joined the foundation board. By this time, the idea of "safe securities" had widened and in 1953 the foundation was given permission to invest some money in equities and real estate to compensate for inflation. These restrictions continued to be loosened, so that today the foundation is required to keep only 30% of its assets in fixed-interest bonds. Geographical limitations have also been relaxed, so now only 13% of the foundation's investments are located in Sweden, with 18% elsewhere in Europe, 22% in the United States, 3% in Japan, and 1% in emerging markets. The remaining 43% are spread between real estate holdings (6%) and fixed-interest investments (37%). Over the past 5 years, the average yearly return on the foundation's stock portfolio was 12.5%, with a high of 25.3% in 1998.

By 1998, the foundation's invested capital had grown to $372 million, from which it spent a modest $11.8 million. The 1998 Nobel laureates were each awarded $894,000, bringing the total for the five prizes—in physics, chemistry, physiology or medicine, literature, and peace—to $4.5 million. The prize-awarding institutions spent $3.8 million assessing candidates. The remaining annual expenditure supports the Nobel symposia, administration, and the prize-giving ceremonies in December.

Despite the apparent health of the foundation's finances, Sohlman and his colleagues are looking for ways to increase the value of the prizes. The very first Nobel Prizes, awarded in 1901, were for 150,800 kronor, the equivalent of about 15 to 20 years of a professor's salary. "It was not until 1991 that we managed to reach the same real value for the prize as in 1901," says Sohlman. "Our ambition is to gradually reduce the ratio between total expenditures and market value of capital. This will make it possible to give priority to future growth in the awards."



Investment roller coaster. After a precipitous slump, the Nobel Prizes took 90 years to regain their real 1901 value.

To do that, the foundation has proposed that it should be freed from the requirement to invest at least 30% of its assets in bonds. It also wants to be able to spend realized capital gains on property and stock and bond investments for annual expenditures. At present, it is only allowed to spend direct returns. "The question of using realized capital gains has arisen recently because revenues from the foundation's investments have not matched the rapid growth in the value of their capital on the stock market," says Bertil Kallner, chief lawyer for the Swedish National Judicial Board for Public Lands and Funds, which oversees the Nobel Foundation.

Whether it will win this freedom, and future Nobel laureates can continue to look forward to more lucrative prizes, now lies in the hands of the National Judicial Board. A decision is expected before the end of this year. But, as Sohlman points out, money isn't everything: "Of course the money is of importance for the prize. But what really counts is the extensive work done evaluating the candidates and creating the worldwide intellectual network which most probably would not be there without the prize."

–JOANNA ROSE AND ANNIKA NILSSON

Rose and Nilsson are writers in Stockholm.

CLIMATE

A Wobbly Start for the Sahara

Could a tiny change in the angle of Earth's orbital axis trigger a cascade of events that turned an ancient Eden into the Sahara desert? Yes, says a report in the 15 July issue of *Geophysical Research Letters*.

Studies of fossilized pollen have shown that grasses and shrubbery covered what is now the Sahara until some unknown environmental catastrophe dried up all the water, leaving nothing but sand. The exact timing is uncertain, but one interpretation of the pollen data suggests that a relatively mild arid episode between 6000 and 7000 years ago was followed by a severe 400-year drought starting 4000 years ago. Such a disaster might have driven entire civilizations out of the desert, leading them to found new societies on the banks of the Nile, the Tigris, and the Euphrates rivers. But the cause of the postulated droughts remained a mystery.

Now, climatologist Martin Claussen and co-workers at the Potsdam Institute for Climate Impact Research in Germany are proposing that Earth's changing tilt triggered the rapid drying of the Sahara. Like a spinning top slowly wobbling on its tip, Earth's tilt has decreased from 24.14 degrees to 23.45 degrees in the last 9000 years, resulting in cooler summers in the Northern Hemisphere. When Claussen introduced cooler Northern summers into a computer simulation of Earth's atmosphere, oceans, and vegetation, the monsoon storms that provide water to the Sahara grew weaker, killing off some of the native plants. The initial reduction in vegetation further reduced rainfall, says Claussen, starting a vicious cycle of desertification that began to accelerate about 4000 years ago. Less than 400 years later, Claussen's team found, the drought caused by the vegetation-feedback mechanism could have wiped out almost all plant life in the desert.

"This is a very exciting result," says climatologist John Kutzbach of the University of Wisconsin, Madison. It is the first time anyone has demonstrated that a change in Earth's tilt can cause a sudden vegetative feedback, he says. "It opens up a whole new class of research problems involving the biosphere," such as predicting feedback effects in global warming.

–MARK SINCELL

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