manently secured to the nation. In such institutions as the Science Museum, the Conservatoire des Arts et Métiers, the Deutsches Museum and the Smithsonian Institution, England, France, Germany and America already possess extensive collections of great value, and there are probably few observatories, laboratories or scientific societies which do not own some historic apparatus, while other instruments are in private hands. Practically every private collection, however, is ultimately dispersed, and the compilation of such a catalogue as that now being formed might lead to the more historic apparatus becoming the nation's property. As with pictures and other works of art, the selective principle should be applied, and a joint committee of the Institute of Physics and kindred societies would be a suitable body to act in an advisory capacity.

In the past, wars, riots and fires have been the cause of the destruction of much valuable apparatus. Gilbert's collection, which he bequeathed to the Royal College of Physicians, was lost in the Great Fire of London; Hevelius lost both observatory and instruments by a fire at Danzig in 1679; the great fire at Copenhagen in 1728 led to the destruction of Römer's telescopes, and the first observatory at St. Petersburg was burnt down in 1747. One of the most deplorable of all losses was occasioned by the fire at the Volta Centenary Exhibition at Como in 1900, when Volta's original piles and cells, etc., were lost. Wars have been no less destructive than fires. The manuscripts of Thomas Harriott, astronomer and mathematician, disappeared during the Civil War; Gregory Saint-Vincent, the seventeenth century geometer, lost all in the siege of Prague; Chladni lost some of his acoustical apparatus during the Napoleonic Wars, while Regnault, after the occupation of Paris by the Germans, returned to his laboratory at Sèvres to find his standard apparatus and the results of his great researches on the expansion of gases ruined. The destruction of Priestley's library and apparatus occurred during the Birmingham Riots of 1791. How important instruments may disappear unrecorded is shown by the case of Sturgeon's electrical apparatus. In 1825 the Royal Society of Arts recorded the award of a medal and thirty guineas to Sturgeon for the gift of his electromagnetic apparatus, but this, including the first electromagnet ever made, has unfortunately long since disappeared. Such, it may be hoped, will not happen to any important collection in the future, and we feel that the Institute of Physics is doing a public service in obtaining records which should go far to prevent such losses from happening.

BRITISH AIR ROUTE TO THE ARCTIC REGIONS

WITH the object of establishing an Arctic air route from Great Britain to Canada an expedition of British scientific men will, according to a wireless despatch to the New York *Times*, make the journey in Sir Ernest Shackleton's historic ship "Quest." A group including surveyors, airmen and meteorologists sailed on July 3 for the Faroe Islands, Iceland and Greenland, where they will stay an entire year exploring a route to the North American continent. The Canadian government has shown great interest in the proposal and will soon undertake a survey of the Canadian end of the proposed route from Winnipeg up through Hudson Bay and Baffinland.

The expedition, which is being sent under the auspices of the Royal Geographical Society, will be equipped for a thorough meteorological and geographical survey of Greenland. Airplanes, fast motorboats and dog-teams for scouting trips will all be at the disposal of the expedition on the shores of Iceland and Greenland and on the vast ice-cap of the interior.

As the route has been surveyed an experimental flight will be made over the entire route from England to Canada and back. Not only is it the shortest route, but it has the advantage that the longest stretch of sea flying necessary is only 300 miles. For more than four fifths of the way there are natural emergency landing grounds and a system of gasoline dumps will be carefully organized.

The whole center of Greenland is a vast ice plateau about 500 miles across on a line between Iceland and Baffinland, and rising to 8,000 feet above sea-level. This plateau has been crossed only twice anywhere near its center, and all crossings have been made in summer.

The expedition will establish a base camp on the southeastern coast of Greenland and a station on top of the ice-cap. Meteorologists will stay on the ice-cap a whole year.

From this central base dog-sled expeditions will set out on journeys into the far north of Greenland and down to the south coast. The coastal base camp will be near the Eskimo settlement of Angmagsalik, about forty miles inshore. The central base will be about 150 miles inland on the highest part of the great frozen plateau.

The Prince of Wales has consented to be honorary president of the committee in charge. The leader of the expedition will be H. George Watkins, who led two previous Arctic expeditions. His companions will be Augustine Courtauld, explorer and surveyor; James M. Scott, surveyor and dog-driver; Flight Lieutenant N. Hughes d'Aets, pilot and meteorologist; Captain Percy Lemon, wireless operator; Lawrence R. Wager, geologist; Andrew Stephenson, chief surveyor; John Rymill, surveyor; Fred S. Chapman, ornithologist and ski expert; Quintin Riley, meteor-

ologist; Wilfred E. Hampton, engineer, and Lieutenant Martin Lindsay, surveyor.

The whole project has the warmest assistance of the British and Canadian government departments. The British Air Ministry has lent Lieutenant d'Aets, who is a Royal Air Force officer, while the War Office has lent Captain Lemon, one of its most expert wireless operators. Many government departments are helping with loans of instruments, while the Vickers Aviation Company has offered a Vellore plane for experimental flights and the Royal Geographical Society has helped technically and financially.

A PRIMARY STANDARD OF LIGHT

THE Bureau of Standards has issued the following statement in regard to its work on a primary standard of light: Up to the present time no satisfactory standard has been available. In this country the unit of light (the candle) has been maintained by a group of 45 carbon-filament electric lamps, to which have been assigned definite ratings when burned under specified conditions. To keep the size of the unit of candlepower unchanged with such electric-lamp standards it was necessary that no changes take place in the lamps themselves, a requirement which can not be met indefinitely by any electric lamp or group of lamps.

The new light source consists of a hollow inclosure of fused thoria immersed in a bath of pure freezing platinum. It is reproducible in that it can be set up anew at any time and does not depend upon the unchanging character of any particular pieces of material. It depends only upon the constancy of a natural phenomenon, namely, the fact that pure platinum will always freeze at the same temperature. The light emitted each time the source has been set up anew has been found to be the same, as compared with the bureau's carbon electric lamp standards, within 1 part in 1,000. This is about the limit of accuracy attainable in photometry.

The old electric lamp standards were irreplaceable and their loss or a serious change in their properties, such as must eventually occur, would in the past have been nothing less than a catastrophe. If, however, such a loss occurred now, the bureau could replace these lamps without the assistance of outside laboratories by rating a new set of lamps in terms of the light emitted by the platinum standard. The relation of this light to the present unit of candlepower has been accurately established as one candle for each 1,700 square millimeters of opening.

It happens, fortunately, that the color of the light emitted by the new standard is practically identical with that emitted by the old standard. It is hoped that before very long the new light source will be recognized generally and adopted as an international standard.

REFORESTATION DURING 1929

FOREST planting by all the principal agencies engaged in the work of reforestation in the United States last year restored to tree growth a total of 111,175 acres, as shown by records just completed by the Forest Service.

The total acreage set out in young forest trees in 1929 included 107,557 acres in the continental United States, 2,084 acres in Hawaii and 1,534 acres in Porto Rico. Reforestation activities included the planting of 31,430 acres by 21 states and two territories, 5,920 acres by municipalities, 25,088 acres by industrial organizations, 539 acres by schools and colleges, and 1,516 acres by other organizations. Plantings by farmers for the extension or improvement of farm woodlots and windbreaks amounted to 24,825 acres, and plantings by other individuals, 6,650 acres. The U. S. Forest Service planted 18,027 acres of land on national forests in 1929.

Michigan, with 27,820 acres restored to tree growth, led the states last year in total acreage planted to forests. New York ranked second with 21,135, and Louisiana third with 10,583 acres. Other states which ranked high in forest-planting activities were Pennsylvania with 6,318 acres; Washington, 4,400 acres; Massachusetts, 3,938 acres; Ohio, 3,428 acres, and California, 3,023 acres.

Industrial forest plantings in 1929 included 10,060 acres planted by pulp and paper companies, 8,732 acres by lumber companies, 3,189 acres by water and power companies, 1,561 acres by mining companies, 100 acres by railroad companies and 1,446 acres by other industrial organizations.

To the end of the calendar year 1929, the cumulative total of all forest planting in the United States of which the Forest Service has record was 1,653,308 acres. This included 274,385 acres of national forest land planted by the federal government, 200,553 acres by states, 46,282 acres by municipalities, 193,262 acres by industrial organizations, 16,335 acres by other organizations, 5,215 by schools and colleges and 917,276 acres by farmers and other individuals. In cumulative acreage planted, Iowa led with 242,260 acres, Nebraska was second with 219,088 acres, Kansas third with 201,190 acres and New York fourth with 183,369 acres.

YALE UNIVERSITY AND THE BERNICE P. BISHOP MUSEUM

YALE UNIVERSITY and the Bishop Museum, Honolulu, have entered into a new agreement which will bring about a closer affiliation of the two institutions.

The research program of the museum, the only institution which devotes its energies solely to a study of the Pacific area, will be integrated with the activities of those departments of the Yale Graduate School