tion. In response, the conference decided to establish a Bureau of Chemical Standards and to entrust its organisation to Belgium. Already before the war the author had started a collection of pure organic liquids, and thanks to the help of M. Chavanne had received a grant from the Solvay International Chemical Institute which enabled him to collect a number of organic products to serve as starting material for the preparation of standards.

The programme has been sketched out as follows:—

(1) It is proposed gradually to extend the existing collection until it contains samples of every well-defined chemical product, but in the first place efforts will be concentrated on, although not confined to, the collection of pure organic liquids, substances which are particularly difficult to obtain at the present time. The collection should therefore contain representatives of typical organic substances which can be preserved in a state of purity without too much difficulty. For this reason it is not proposed to keep esters which are readily hydrolysed, but only the acids and alcohols from which they are derived.

(2) It is intended to maintain a depôt of standard substances which have been prepared in the United States, or in any country adhering to the International Union, so that the results of the labours of American chemists may be made available to their colleagues in Europe.

(3) Small quantities of the standard substances will be placed at the disposal of Belgian and foreign scientists to save them the tedious work of re-purification. It will therefore be desirable that the samples shall be made from single batches of materials weighing several kilograms; and this will inevitably lock up considerable capital.

(4) The Bureau will act as a centre of information on all matters appertaining to pure products, rare specimens, and the relevant literature.

How to help the Bureau.—(1) To-day more than ever money is the nerve of action, and therefore all who appreciate the importance of the work are asked to aid in developing its financial resources. Such an undertaking far exceeds the power of any one man, but a relatively small endowment would suffice for the institution of research scholarships to enable the Bureau to obtain the necessary collaborators.

(2) Industrial firms will be free to make a substance once the method of preparation has been definitely established. The Bureau, content with its *rôle* of pioneer, will then be able to turn its attention to new preparations. It is hoped that the example set by the Kodak Company in America will be followed in Europe. Manufacturers, in their turn, will be able to render great assistance by supplying the necessary starting materials and raw products, so reducing the amount of capital locked up in the collection; in this way they would encourage scientific work of general interest.

(3) In conclusion, directors of laboratories can greatly assist their colleagues by placing at the disposal of the Bureau specimens of pure materials or rare substances which they have made in the course of their work and which may be useful as standards. If a director wished to retain the material himself, he could make known to others, by means of the Bureau, that his specimens were available; and exchanges could be effected that would be advantageous to all concerned. For a similar reason specialists in this sphere are asked to keep the Bureau informed of the progress of their work, in order that it may be made known to all interested in the subject.

With the help of Belgian and foreign chemists it is hoped to carry out this programme of work; and for this the memory of Stas, that pioneer of chemical standards, will act as a stimulus.

TURPENTINE IN THE UNITED STATES.

A recent bulletin by F. P. Veitch and V. E. Grotlisch (U.S. Dept. Agric., Bureau of Chem. Bulletin No. 898. 1920) contains much useful information on the production, marketing, and uses of turpentine in America. About 75 per cent. of the world's supply of turpentine is produced in the United States, chiefly from the southern longleaf yellow pine (*Pinus palustris*), but other species, such as the Cuban or slash pine (*P. caribæa* or *heterophylla*), the rosemary pine (a variety of the loblolly pine *P. taeda*) and the western yellow pine (*P. ponderosa*) are also tapped; most of the remaining 25 per cent. is obtained in the south-western coast regions of France from the maritime or cluster pine (*P. pinaster* or *maritima*). The relative production of turpentine in the various States of America is approximately as follows:—Florida, 37 per cent.; Georgia, 19 per cent.; Louisiana, 15 per cent.; Alabama, 12 per cent.; Mississippi, 9 per cent.; Texas, 7 per cent.; North and South Carolina, less than 1 per cent. Formerly North Carolina produced the bulk of the world's supply of turpentine. At present less than 10 per cent. of the total is wood turpentine obtained from stumps and deal or fallen timber by steam or destructive distillation; this source of turpentine is becoming more important.

The oleo-resin is obtained by scarifying or "chipping" the living trees. A V-shaped cut is made about once a week immediately above the last cut, thereby forming a "face," down which the gum exuding from the cut flows and collects in galvanised iron or baked clay cups holding 1 to 2 quarts. The tapping season lasts from early spring to late autumn, the oleo-resin being removed from the cups about once a month and taken to the still in barrels.

The distillation plant is simple and has not been improved materially during the last 50 to 60 years; it consists of a copper still of 500 to 1000 gallons capacity, with a still-head (generally removable) connected to a large copper condensing-coil cooled in water. From 7 to 14 barrels of oleo-resin go to make a charge, depending on the size of the still and the nature of the oleo-resin.

The oleo-resin contains some water, and the distillate at the commencement consists of about 45 per cent. of turpentine and 55 per cent. of water. When most of the water originally present has passed over, as shown by a decrease of the water contained in the distillate to about 30 per cent., and by the peculiar sound which is heard close to the tail-pipe of the condenser coil, a small stream of water is admitted to the still. The distillate is collected in a barrel in which it separates from water; it is desirable to cover the barrel to avoid loss by evaporation. The yield of turpentine varies from 16 to 22 per cent. The turpentine is mostly shipped in wooden casks holding 50 to 53 U.S. gallons (231 cb. in.). These barrels are treated internally with two coats of glue to prevent the turpentine from penetrating the wood; steel drums are used only to a slight extent, but the larger producers, especially in the more western States, employ tank-cars of 5 to 10 thousand gallons capacity. On arrival at the primary markets each barrel or tank-car is inspected, and the grade (colour), purity and freedom from water, and volume of the turpentine determined.

The total production in the U.S.A. for the 1919 season amounted to 366,000 casks (50 galls.) of turpentine and 1,237,000 barrels (500 lb.) of rosin; during 1920 up to August 1, 237,155 casks of turpentine and 712,387 barrels of rosin were produced, the estimated production for the rest of the season being

233,876 casks of turpentine and 739,679 barrels of rosin.

The bulletin gives details of the market customs prevailing in the U.S. turpentine trade, of the methods employed in gauging barrels and tank-cars, together with references to the laws governing the sale of turpentine in various States, and also quotes the specifications recommended for turpentine by the U.S. Inter-departmental Committee on Paint Specification Standardisation (Oct., 1919), with full details of the methods of sampling and analysis.

SOCIETY OF CHEMICAL INDUSTRY.

ANNUAL MEETING, 1921.

Accommodation on the s.s. "Melita."

Members and their friends who intend proceeding to Canada for the meeting, and who have decided to travel with the President and his party on the "Melita" (not the "Megantic," as inadvertently stated in the last issue), are requested to secure their berths with the least possible delay. The offices of the C.P.O.S. are: Pierhead, Liverpool; 62-65, Charing Cross, Trafalgar Square, S.W. 1; and 103, Leadenhall Street, E.C. 3; at any one of which arrangements may be made.

Return Sailings from Montreal.

For the information of those who desire to return *viâ* Montreal, the following sailings of C.P.O.S. steamers are given:—

		First Class Minimum £ s.		Second Class Minimum £ s.
Sept. 10.	Empress of Britain	51 10	..	31 10
Sept. 16.	Victorian	—	..	30 0
Sept. 20.	Metagama	—	..	32 10
Sept. 23.	Melita	—	..	32 10
Sept. 24.	Empress of France	51 10	..	31 10
Sept. 30.	Minnedosa	—	..	32 10

"Empress" steamers sail from Quebec only, but free railway tickets will be provided between Montreal and Quebec. All other steamers carry "cabin" class only from Montreal. Members and their friends who wish to return home by one of these boats should communicate with the C.P.O.S. before the end of June, and the company will arrange for reserved accommodation.

Passport Regulations.

The following information regarding passport regulations should be noted: Passengers travelling to the United States *viâ* Canada and passengers proceeding to Canada *viâ* the United States must obtain the U.S. consular *visa* on their passports before they leave the United Kingdom. Passengers who are not U.S. citizens must make *personal application* for *visa* at the U.S. Consulate nearest their place of residence. One photograph of each passenger is required. Application should be made not less than two weeks prior to the date of sailing. Passengers travelling from the United Kingdom to the U.S. *viâ* Canada cannot obtain the American consular *visa* in Canada; it must be obtained in the United Kingdom prior to sailing. Forms and full information regarding procedure are obtainable at the Canadian Pacific offices.

U.S. Head Tax.—As required by the U.S. Government, all passengers (excepting U.S. citizens) proceeding to points in the United States must pay at the time of booking the head tax of £2 5s. per person in addition to the ocean fare; children under 16 years of age accompanying their father or their mother are exempt.

VISIT TO SHAWINIGAN.

Arrangements have been made to take the visiting members of the Society to Shawinigan Falls immediately after the conclusion of the Annual Meeting. A special train is being provided for members and their friends, which will leave Montreal at 11.30 p.m. and arrive at Shawinigan Falls next morning.

Shawinigan Falls owes its existence to the splendid electric-power development; prior to 1898 it was a forest wilderness, but the year following the Shawinigan Water and Power Co. installed two 5000 h.p. generators, which formed the nucleus of the present development of the district, now amounting to over 300,000 h.-p. It is estimated that the district has a potential capacity of over a million h.-p.; this power is the foundation of a group of chemical industries which compare favourably with any on the American continent using over 130,000 h.-p.

The pioneer chemical industry to be established was the Northern Aluminum Co., which started operations about 1901 and now uses ten times as many h.-p. as at that time. The principal raw material—bauxite—has not yet been discovered in Canada, but is imported from Arkansas. The process followed is the well-known Hall method of producing aluminium by direct current, using a bath of alumina in fused cryolite. In addition to manufacturing aluminium, the company also maintains a wire-drawing plant, and makes all the aluminium wires and cables used in Canada.

Following closely on the heels of the Aluminum Company, the Belgo-Canadian Pulp and Paper Co. started operations in 1903. This undertaking owns large timber areas on the St. Maurice River and its branches, down the streams of which the logs are floated to the mill. The company produces both ground-wood and chemical pulp, and in addition makes over 90 tons of paper per day.

The Canada Carbide Co. was established in 1903, the first installation being one small single-phase electric furnace. From this small beginning it has grown to such an extent that it now occupies some fifteen acres of land, upon which have been erected lime-kilns, buildings for storage, two main rooms where the carbide is produced in furnaces ranging from 3000 to 10,000 h.-p. The carbide is crushed, sorted and packed in separate rooms, and there is a small plant for manufacturing steel drums and wooden crates for shipping.

The Canadian Electro-Products Co. came into existence to supply the demand for acetone in cordite manufacture during the war. Production from calcium acetate obtained by wood distillation proved entirely inadequate and, at the request of the British Ministry of Munitions, the Shawinigan company started investigating the possibility of producing acetone synthetically from acetylene. The experimental work was begun in December, 1915, and after a half-year's intensive research by five Canadian chemists, construction was commenced in May, 1916. By January, 1917, the whole plant, covering fifteen acres, was complete, and the first car of acetone shipped to England. The working out of the process, of which the steps are carbide→acetylene→acetaldehyde→acetic acid→acetone, involved the development on a large scale of reactions hitherto only performed in the laboratory and which presented difficult and unusual problems; and it is very much to the credit of those concerned that when the plant was doubled at the entry of the United States into the war only a few minor changes were made in the design and arrangement of the equipment. The production exceeded 10,000 tons of acetic acid in 1918. Acetone is not manufactured at the present time; the process is stopped at the acetic-acid stage, 99 per cent. acetic acid being obtained in one distillation.