

# Where and How Insulin is Made

Tucked away in an obscure corner of the University of Toronto grounds, overshadowed by the new electrical engineering building, and flanked by a row of venerable elms, stands a two-story, red-brick building formerly occupied by the University Y.M.C.A. A year or two ago it was planned to remove the building, as it was not suitable for any university purpose. To-day, however, as it does, the only "insulin laboratory" in Canada, the building, together with its recently installed equipment, is worth upwards of \$35,000.

The Insulin Laboratory is one of the latest chapters in the romance of insulin. It stands as a confirmation of the success of the research of Dr. F. G. Banting and his fellow investigator, Charles H. Best, M.A. Its management and operation are in the capable hands of Mr. Best, who has, from the beginning, been in charge of the large-scale production of insulin. The laboratory is operated as a division of the famous Connaught Anti-Toxin Laboratories, of which Dr. J. G. Fitzgerald is director and Dr. R. D. Defries, associate director. The business administration is in charge of Dr. Fitzgerald and Dr. Defries. Mr. Best is assisted in the new laboratories by D. A. Scott, M.A., an assistant director, and a staff of twenty-six people working night and day shifts. With the exception of three trained chemical technicians, under direction of Mr. Arthur Wall, who was the first technician to assist Mr. Best when the manufacture of insulin was begun, and four chemists, the staff is largely technically untrained. During the summer months five medical students were employed in the laboratories and during the winter two students are engaged in part-time work.

The erection of such a completely equipped plant was made possible through the Ontario Government's grant of \$25,000, the remaining \$10,000 to \$15,000 being secured from funds of the laboratory and from private donations. The plant is now producing in the neighborhood of 250,000 units a week for distribution throughout Canada, Ireland, South Africa, Central and South America, New Zealand, Australia, and other countries where plants have not been established. The average dosage for the diabetic patients for whom such a large quantity of insulin is being prepared varies from 15 to 20 units a day.

The price for which insulin is distributed is, as with other products of the Connaught Laboratories, governed entirely by costs of material and of production. The Connaught Laboratories are not engaged in commercial business but constitute a department of the University of Toronto. Mr. Best has called attention to the gradual fall in the price of insulin. In May, 1923, the material was sold at 5 cents per unit, in June at 3 cents per unit and now at 2 cents per unit.

The distribution of insulin is effected through two channels. The first is hospitals which have organized departments for the administration of insulin. The second is through physicians trained in the use of insulin. For these latter a special short course of instruction was provided at the University of Toronto last July under the direction of Professor Duncan Graham.

The preliminary stages in the preparation of the health-giving extract are conducted in a large laboratory in the north-east corner of the insulin building where beef and pork pancreas (sweetbreads), fresh from the abattoirs, are first minced in a large meat-grinder, dissolved in vats of alcohol, and then placed in a large basket centrifuge. The liquid is drawn off from the centrifuge and further clarified by filtration through paper in glass funnels. This liquid, containing the soluble constituents of the pancreas, is reduced to a small volume by evaporation of the alcohol and water content in a large vacuum still. The residue contains the insulin. The solution is purified in two chemical laboratories, one on the main floor and one on the second floor, by chemical procedures known as "fractional precipitations." The purified product is then sterilized, standardized, and filled into vials for distribution by the Connaught Laboratories.

On the second floor, in addition to the purification laboratory, there is a laboratory in which two chemists are employed on research work in connection with insulin. Clean, well-ventilated rooms are provided for the animals used and a small operating room is near at hand.

The preparation of insulin is controlled by patents applied for in various countries of the world by the original investigators. These patents have been assigned to the University of Toronto and a committee, appointed by the Board of Governors, is responsible for the administration of patent and other rights and for the promotion of efficient production and distribution of insulin in all countries of the world. The original investigators, Dr. Banting and Mr. Best, receive no financial benefit from the patent but desired to prevent the filing of other patents which might restrict the preparation of insulin. In Great Britain complete patent rights have been assigned to the British Medical Research Council and in the United States the Ely Lilly Company of Indianapolis has been licensed by the University of Toronto to manufacture insulin. The licensing of other firms in the United States is at present under consideration. Rights in all countries except Great Britain have been retained by the University of Toronto. The patents for insulin have been obtained largely through the efforts of C. H. Riche, a patent lawyer of Toronto, who has given his services to the University without charge.

In addition to carrying out his duties as director of the Insulin Laboratory, Mr. Best is continuing the fifth year of his course in Medicine, which he interrupted in 1921 to collaborate with Dr. F. G. Banting in the researches which led to the discovery of the insulin treatment of diabetes.



THE ALLIED DEBTS

"You have often proclaimed that the payment of debts is a matter of national honor."

"True, my dear fellows. But I was speaking always of Germany, never of France."

(The United States and Britain may shortly press for the payment of the French war debts)

## TAKING BIG PART IN ELECTION CAMPAIGN

### Most of the Canadian Candidates in Field Having a Hard Fight.

A despatch from London says: The Empire in one way or another is playing a big part in the general election. Premier Baldwin has been greatly encouraged in his campaign by messages of appreciation he has been receiving from the Dominions, Canada included. Lord Beaverbrook, after some apparent wavering, has now plumped in his newspaper for an out and out policy of Imperial preference, no matter by whom expounded.

Canadian candidates are in the field for election and most of them are having a hard fight. There will now probably be a three-cornered contest in the Isle of Wight where a straight fight between General Seely and Peter MacDonald, a Canadian, had been expected. Col. Maurice Alexander, who last year, snatched Southwark from Labor by 2,000 votes, is running against his defeated opponent, Col. Hamilton Gault who has set himself a hard task in Taunton, where Sir Arthur Griffith-Boscawen was defeated a year ago. Col. Gault in three weeks' campaigning must bring about a turnover of 1,500 votes. If personality counts for anything Col. Gault's fight may not prove altogether a forlorn hope. In his whirlwind campaign he makes good friends and wins votes wherever he goes. He is waging his campaign with the assistance of Gen. MacBrien, Chief of the Canadian General Staff.

## Describes 3 Infractions of Law in 17 Words

Winnipeg, Nov. 26.—A letter alleging three law infractions in seventeen words was received to-day by Deputy Minister of Agriculture, J. H. Evans, who, for obvious reasons, is withholding the place of origin and the name of the informant. The letter reads:

"My neighbor has guns, he kill deer. Him am seller of whiskey, too. Bull runs at large."

Mr. Evans describes the letter as the pithiest of his experience.

Carrying about a million dollars worth of furs and a number of passengers, the Hudson's Bay Company steamer "Baychimo" arrived at Vancouver recently from Arctic waters. The vessel, which operated as a passenger carrier during the summer on the Siberian coast, penetrated into the Arctic as far as North Cape.

## S. J. Farmer Re-elected Mayor of Winnipeg

A despatch from Winnipeg says: S. J. Farmer, Labor, was re-elected Mayor of Winnipeg on Friday by a majority of 4,899. The unsuccessful candidate was Robert Jacob.

The contest was fought on a variety of issues, including the record of Mr. Farmer as Mayor during the past year, the platform of the Independent Labor party, which endorsed his candidature, the policy and personnel of the Winnipeg Civic Association which brought Mr. Jacob into the field, the alleged intentions of the Winnipeg Electric Railway in the matter of their city franchise, and the general question of public utilities and the city Hydro system in particular.

## Newfoundland and Britain Gossip Over Radio

St. John's, Nfld., Nov. 26.—"Hello, Hello. Hello. This is the British Isles speaking." These words, quite clear and distinct, reached J. Morris, electrical superintendent with the Reid Newfoundland Co., at St. John's, from Z10 Station, London, England, over his radio receiving set last night. He also heard the station at Newcastle.

Victoria, B.C.—The whaling season this year did not come up to expectations. Bad weather in September and October spoiled what might have been an unusually successful year. The total catch this year was 454 whales.



Col. Hamilton Gault. Famous Canadian soldier and commander of the Princess Pats in the great war, who is entering British politics as a supporter of the protection policy.

# Weekly Market Report

## TORONTO

Manitoba wheat—No. 1 Northern, \$1.04; No. 2, \$1.03; No. 3, \$1.02.  
Manitoba oats—No. 3 CW, 42¢; No. 1 extra feed, 41¢.  
All the above track, bay ports.  
American corn—Track, Toronto, No. 2 yellow, \$1.17.  
Ontario barley—No. 2, 58 to 60¢; Buckwheat—No. 2, 72 to 75¢; Ontario rye—No. 2, 73 to 75¢; Peas—Sample, \$1.50 to \$1.55; Millfeed—Del. Montreal freights, bags included: Bra., per ton, \$27; shorts, per ton, \$30; middlings, \$36; good feed flour, \$2.05.  
Ontario wheat—No. 2 white, 94 to 96¢ outside.  
Ont. No. 2 white oats—\$8 to 40¢.  
Ontario corn—Nominal.  
Ontario flour—Ninety per cent. pat. in five bags, Montreal, prompt shipment, \$4.75; Toronto basis, \$4.78; bulk, seaboard, \$4.25.  
Manitoba flour—1st pat. in five sacks, \$6.30 per bbl.; 2nd pat., \$5.80.  
Hay—Extra No. 2 timothy, per ton, track, Toronto, \$14.50 to \$15; No. 2, \$14.50; No. 3, \$12.50; mixed, \$12.  
Straw—Car lots, per ton, \$9.  
Cheese—New, large, 123 to 24¢; twins, 24 to 25¢; triplets, 25 to 26¢; Silttons, 25 to 26¢; Old, large, 30 to 31¢; twins, 31 to 32¢.  
Butter—Finest creamery prints, 41 to 43¢; No. 1 creamery, 38 to 40¢; No. 2, 36 to 38¢.  
Eggs—Extras, fresh, in cartons, 70 to 74¢; extras, stored, in cartons, 45 to 47¢; extras, 42 to 43¢; firsts, 38 to 39¢; seconds, 30 to 32¢.

Live poultry—Spring chickens, 4 lbs. and over, 25¢; chickens, 3 to 4 lbs., 22¢; hens, over 5 lbs., 22¢; do, 4 to 5 lbs., 15¢; do, 3 to 4 lbs., 15¢; roosters, 15¢; ducklings, over 5 lbs., 20¢; do, 4 to 5 lbs., 18¢; turkeys, young, 10 lbs. and up, 23¢.  
Dressed poultry—Spring chickens, 4 lbs. and over, 33¢; chickens, 3 to 4 lbs., 30¢; hens, over 5 lbs., 28¢; do, 4 to 5 lbs., 24¢; do, 3 to 4 lbs., 18¢; roosters, 18¢; ducklings, over 5 lbs., 28¢; do, 4 to 5 lbs., 25¢; turkeys, young, 10 lbs. and up, 38¢.  
Beans—Canadian hand-picked, lb., 7¢; primes, 6½¢.  
Maple products—Syrup, per irp. gal., \$2.50; per 5-gal. tin, \$2.40; gal., maple sugar, lb., 25¢.  
Honey—60-lb. tins, 12 to 13¢ per lb.; 10-lb. tins, 12 to 13¢; 5-lb. tins, 12 to 14¢.

Corn, 14¢; 2½-lb. tins, 14 to 15¢; comb honey, per doz., No. 1, \$3.75 to \$4; No. 2, \$3.50 to \$3.60; No. 3, \$3.25; 27¢; cooked hams, 39¢; smoked rolls, 21 to 23¢; cottage rolls, 22 to 24¢; breakfast bacon, 25 to 27¢; special brand breakfast bacon, 30 to 35¢; backs; boneless, 30 to 35¢.  
Cured meats—Long clear bacon, 50 to 70 lbs., \$18; 70 to 90 lbs., \$17.50; 90 lbs. and up, \$16.50; lightweight rolls, in barrels, \$36; heavyweight rolls, \$33.  
Lard, pure tines, 18 to 18½¢; tubs, 18½ to 19¢; pails, 19 to 19½¢; prints, 20½ to 21½¢; shortening tines, 15½ to 16½¢; tubs, 15½ to 16¢; pails, 16 to 16½¢; prints, 18½ to 18½¢.  
Heavy steers, choice, \$6.75 to \$7.25; butcher steers, choice, \$5.75 to \$6; do, com., \$3 to \$4; butcher heifers, choice, \$5.75 to \$6.25; do, med., \$4 to 5; do, com., \$3 to \$3.50; butcher cows, choice, \$4 to \$4.50; do, med., \$3 to \$4; canners and cutters, \$1.50 to \$2.50; butcher bulls, good, \$3.50 to \$4.50; do, com., \$2.50 to \$3.50; feeding steers, good, \$3 to \$5.50; do, fair, \$4.50 to \$5; stockers, good, \$4 to \$5; do, fair, \$3.50 to \$4; milkers and springers, \$80 to \$110; calves, choice, \$10 to \$11; do, med., \$8 to \$9; do, com., \$4 to \$5; do, grassers, \$3.50 to \$4.50; lambs, choice, \$10.25 to \$10.50; do, bucks, \$9 to \$9.25; do, com., \$8 to \$8.50; sheep, light ewes, good, \$6 to \$6.50; do, fat, heavy, \$4 to \$5; do, culls, \$2 to \$2.50; hogs, thick smooth, F.W., \$8.25; do, l.o.b., \$7.75; do, country points, \$7.50—do, selects, \$9.00.

## MONTREAL

Oats, Can. West, No. 2, 55¢; No. 3, 54¢; extra No. 1 feed, 52½¢; No. 2 local white, 51½¢. Flour, Man. spring wheat pats., 1½¢, \$6.30; 2nds, \$5.80; strong bakers, \$6.60; winter pats., choice, \$5.75 to \$5.85; Rolled oats, \$36, 10 lbs., \$3.05; Bran, \$27.25; shorts, \$30.25. Middlings, \$36.25. Hay, No. 2, per ton, car lots, \$15 to \$16.  
Cheese, finest westerns, 19½ to 19¾¢; finest easterns, 18½ to 18¾¢. Butter, No. 1 creamery, 38 to 38½¢. Eggs, extras, 40 to 41¢; No. 1 stock, 36 to 37¢; No. 2 stock, 30 to 32¢. Canners, \$1.40; cutters, \$2 to \$2.25; bulls, \$2.25 to \$2.75; good veal calves, \$10; grassers, \$3; hogs, thick smooths and butcher, \$8.50; sows, \$6.50 to \$7.

## KING GEORGE'S SONS TO BE CREATED DUKES

### Younger Members of Royal Household to Succeed to Ancient Titles.

A despatch from London says: King George will create two more royal dukes in the persons of his younger sons, Prince Henry and Prince George, it is stated by some court intimates. This step has been urged for some time, as there have been royal dukes in England since the days of George III, whose ample family supplied seven holders of dukedoms.

This number gradually dwindled until in the latter part of Queen Victoria's reign they were confined to her three sons, and at the coronation of George V, there were only two—the Prince of Wales as Duke of Cornwall, and the Duke of Connaught. At present this has only been supplemented by the creation of Prince Albert in 1920 as Duke of York, and the existing number is barely sufficient to officiate at the opening of bazaars, and the unveiling of monuments and to attend to the other duties which fall upon royal shoulders.

Current rumors have opened up speculation as to the titles which will be chosen from the list of those which have been connected generally with the royal family. The title of Duke of Edinburgh is a concession to Scottish pride and for several centuries has always fallen upon some royal son. This title probably will be chosen for Prince Henry. It was last borne by the second son of Queen Victoria and discarded when he assumed the German title of his father, the Duke of Saxe-Cobourg-Gotha.



Earl of Cavan, Chief of the Imperial General Staff, who is leaving for a visit to Singapore and on his return will be a visitor at several Canadian cities.

## Fifty Elected by Acclamation to British Parliament

London, Nov. 26.—Fifty candidates were elected to the British Parliament by acclamation to-day, as follows:

CONSERVATIVES	35
LIBERALS	11
LABORITES	3
NATIONALIST	1
Total	50

The odds quoted in financial quarters are 4 to 1 against a Liberal victory and 14 to 1 against Labor. There seems to be a general view that the Government will be returned by a majority of at least forty or fifty.

The production of lumber in British Columbia for the first eight months of 1923 was twenty per cent. higher than the best previous record. This will easily be the best year in the history of the lumber industry in the province.



WHEN DEATH WIPES OUT POLITICAL BARRIERS

A significant picture at Bonar Law's funeral, in which the leaders of the three great political parties in Great Britain are grouped around the bier to the throne. The Prince of Wales, is conversing with Ramsay Mac Donald, the leader of the British Labor Socialists, H. H. Asquith, leader of the Liberal party, is at the left, and Premier Baldwin, leader of the Conservatives, on the right. This is a picture which could scarcely be duplicated in any country in the world, for British statesmen of rival parties are often good friends in private life.

## OLD WORLD ARCHIVES RICHES FOR CANADA

### Dominion Archivist Succeeds in Securing for Nothing Pricelless Historical Records.

A despatch from London says: Dr. A. G. Doughty, Dominion Archivist, sailed on Saturday for Canada after a most successful raid on the private treasures in England and France, for documents of historical importance for the Dominion. Canada's chief archivist, who, as a tireless collector for his department, has won international fame for his ability to get something for nothing, is said to have surpassed himself on this occasion. Besides Sir Leicester Harmsworth's gift of the Wolfe Papers, the decision of the Hudson Bay Company to make its record available, and an arrangement for the publication of a series of biographies of makers of Canada, Mr. Doughty has been promised a mass of other material of priceless historical value.

It is hoped to obtain from English banks and trading houses records which will throw a new light on early commerce with the new world. From France it is hoped to obtain documents relating to the famous company of One Hundred Associates, as well as papers preserved by descendants of Bigot Talon and other great figures in the early history of new France. More interesting than all, perhaps, is the likelihood of securing a document signed in Canada in 1585 by Jacques Cartier. It will be the oldest record in all America, antedating that now possessed by the Canadian Archives, which is dated 1542. The money values of these collections aggregates thousands of pounds. Canada is securing them for nothing.

## POINCARÉ REVERSES HIS FOREIGN POLICY

### Aims to Conciliate Great Britain and Puts Reparations Issue in Second Place.

Paris, Nov. 24.—Premier Poincaré finally has reversed his foreign policy. No longer will he put reparations for France uncompromisingly first and friendly relations with Great Britain and the United States second. Hereafter he may be expected to follow in the footsteps of the Premiers who have preceded him, and whose policies he condemned so bitterly in the recent battle of Yellow Book notes with Lord Curzon.

He aims now to conciliate Great Britain at almost any cost and to interest her and the United States, once more in France's security, if it is not too late. To-night, the semi-official Temps, and the Journal des Debats, begin to prepare the way. The Temps takes the theme: "The French government must neglect nothing in order to act in concert with the other Allies." And the Journal des Debats says: "No form of guarantees will provide us an efficacious security. Signatory Governments would nevertheless decide their action according to circumstances and the condition of their public sentiment. We must, therefore, entertain with the United States and Great Britain amicable and cordial relations."