compared with the edible stem (leaves 28–12 and stem 18 gm. per 100 gm.), while the fibre content does not show the same steep rise that is common in grass during summer-time; and it appears to be a useful source of proteins and minerals.

TABLE 1. CHEMICAL COMPOSITION OF RHUBARB LEAVES, PER CENT

Water	Protein	Fat	N. free extr.	Fibre	Ash	Ref.
90·0	2·8	0·4	3·9	1·0	1·9	(23)
91·5	1·6	0·1	5·1	0·7	1·1	(24)
64·5	0·3	0·1	2·6		0·5	(22)

Preliminary observations were made on four mature rabbits, two of each sex, which received a mixed diet including one rhubarb leaf each on the first day, rising to 4 oz. per head by the twenty-fourth day. After the first day there was no serious difficulty in getting them to eat rhubarb leaves. At the end of this time the rabbits were still in good condition and showed no abnormal symptoms.

Feeding Rhubarb Leaves v. Grass

A small feeding trial was started with twenty young Beveren rabbits, aged approximately ten weeks old. These were divided into two similar groups; the control group received grass as their green-food, and the other group received green rhubarb leaves (cut twice weekly), which they cleared satisfactorily by the fourth day. Both lots were also fed a basal allowance of growers meal mash, containing 1·8 per cent calcium, and water daily. Hay was given twice weekly.

Under this system both groups grew well on their respective foods during May and June. In May the young grass was of very good quality and the group fed on it showed only a very trifling advantage in live weight (up to 0·3 oz.); but from the second week of June (sixth week of test) there was a seasonal decline in the feeding value of this green-food, which is reflected in the small advantage in the live weights of the rhubarb group thereafter. After nine weeks comparison the rhubarb group had gained an average of 3·3 oz. more than the grass group. The average weekly weighings for the two groups are set out in Table 2.

TABLE 2. AVERAGE LIVE WEIGHTS (LB. AND OZ.)

	Control grass	Rhubarb leaves	Month
Initial weight	3 2·0	3 2·0	
Week 1	3 7·2	3 7·0	May
2	3 14·0	3 13·7	,,
3	3 15·2	3 14·9	,,
4	4 4·0	4 3·9	,,
5	4 6·5	4 5·7	June
6	4 6·9	4 9·6	,,
7	4 14·1	4 15·8	,,
8	4 14·7	5 1·1	,,
9	5 1·7	5 5·0	June/July

There was no mortality or sickness in either group, and at the tenth week of the feeding comparison half of each group was slaughtered. These were all in excellent condition with substantial deposition of internal fat, irrespective of the feeding group. Carcasses were of ideal size for the domestic trade. The killing weights are summarized in Table 3.

TABLE 3. AVERAGE SLAUGHTER WEIGHTS

Group	Live weight	Carcass cold	Skin	Carcass percentage
	lb. oz.	lb. oz.	oz.	
Grass	5 4·4	3 3·4	8·9	60·9
Rhubarb	5 3·4	3 2·6	9·2	60·7

The carcasses, from both groups, dressed out at a satisfactory ratio to live weight for their age, but failed to show any important difference due to diet.

The remainder of the stock continued to receive grass, including weeds during a droughty spell, or alternatively rhubarb, as their only source of green-food throughout July to the end of October, and the live weights in each of these months showed the rhubarb leaves maintaining a slight advantage over grass, with one exception in September, when they were equal. This was after feeding more weeds than grass to the control group. At the end of October (six calendar months on the respective green-foods) the rhubarb group were heavier by an average of 4 oz. (weights, grass 7 lb. 3·2 oz. and rhubarb 7 lb. 7·2 oz.). Their condition was then noted as 'very good to excellent' and there was no discernible difference in the fur development between the two groups. By this time, the supply of green rhubarb leaves was nearly exhausted and the tops were dying. The feeding comparison then terminated, after demonstrating that this waste material is a satisfactory alternative for grass in these rabbit rations.

[1] Brocq-Rousseu, M., *Progres Med.*, **6**, 2075 (1933).
[2] Burton, W. E., *Brit. Med. J.*, **2**, 2026 (1910).
[3] *J. Amer. Med. Assoc.*, **68**, 1954, 1699, 1978 (1917).
[4] Foy, G., *Med. Press*, **154**, 453 (1917).
[5] Karten, O. A., Svenska läk-salsk förh., 348 (Stockholm, 1918).
[6] *Lancet*, **1**, 1110 (1915); **2**, 847 (1917).
[7] Leffmann, H., *J. Amer. Med. Assoc.*, **73**, 928 (1919).
[8] Maillart, *Rev. Med. de la Suisse Rom.*, **38**, 344 (1917).
[9] *Pharm. J.*, **98**, 413, 847 (1917).
[10] Sainsbury, H., *Lancet*, **2**, 24 (1917).
[11] Sippy, J. J., *J. Amer. Med. Assoc.*, **73**, 627 (1919).
[12] Barron, N. S., *Harper Adams Util. Poult. J.*, **13**, 561 (1927–28).
[13] Bell, F. R., "Green Foods", 2nd ed., 92 (Idle, Bradford, 1928).
[14] Davies, C. J., "Rabbits for Fur and Flesh", 91 (London, 1918).
[15] Domestic Poultry Keepers' Council, "Raising Rabbits for Meat" (London).
[16] (Dyson, H.), "Profitable Rabbit Keeping", 31 (Idle, Bradford).
[17] Goodchild, C. H., "Rabbit Keeping for Meat and Fur", 21 (Woking).
[18] Pickard, J. N., Brit. Rabbit Counc. Book, 26 (Cambridge, 1941).
[19] Thompson, A., and Goodchild, C. H., "Keeping Poultry and Rabbits on Scraps", 126 (Harmondsworth, 1941).
[20] Schneider, H., *Biedermanns Zentralbl.*, A, **5**, 371 (1935).
[21] Steyn, D. G., "Toxicology of Plants in South Africa" (Johannesburg: Central News Agency, 1934).
[22] Chatfield, C., and Adams, G., U.S. Dept. Agric., Circ. 549 (1940).
[23] Kling, M., "Die Kreigsfuttermittel" (Stuttgart, 1918).
[24] Plimmer, R. H. A., "Analyses and Energy Values of Foods", 166 (London, 1921).

NATIONAL RESEARCH COUNCIL OF CANADA

ANNUAL REPORT

THE twenty-eighth annual report of the National Research Council of Canada, for the year 1944–45 (Ottawa. Pp. 40), includes the report of the President, the financial statement and the reports of the directors of the Divisions of Applied Biology, Chemistry, Mechanical Engineering, Physics and Electrical Engineering, and of the Research Plans and Publications Section and the Section on Codes and Specifications, together with a table of scholarships awarded.

Except for the long-term project on forest-tree breeding, all the work of the Division of Applied Biology was related to the war effort. The fermentation of wheat to give butylene glycol received detailed study in the pilot plant, and the time of fermentation was reduced almost by half by removing carbon dioxide under reduced pressure. Cyclic acetal has been added to the list of chemicals obtainable from butylene glycol, and a continuous process worked out for methyl ethyl ketone. A greatly

improved method has been developed for the polarimetric determination of starches, and tetrahydrofurfuryl alcohol, easily made from agricultural waste, is a promising permanent type of anti-freeze. A pilot plant was constructed for separating starch and gluten from wheat, based on processes developed in the laboratory, and the expansion of the work on industrial utilization of agricultural wastes and surpluses included the building of a new laboratory. Methods for the extraction of rubber from native and introduced plants continued to receive attention, and the rubber pilot plant was adapted to include solvent-extraction methods. Work on 'tropicalization' assumed major proportions during the year and much Service equipment was placed under test. Copper dimethylglyoximate and other chemical treatments gave promising results for rot-proofing fabrics, especially canvas. In the food field, the work on dried eggs was expanded to include dried egg and sugar mixtures, a product which has shown distinct promise. Work on liquid and shell eggs was renewed, with the emphasis on methods extending their storage life. Co-operative studies with the Ontario Research Foundation and the Associate Committee on Grain Research were continued on processing and treating domestic oils for food. An investigation was initiated on the treatment of butter to improve its stability for use by the Services under tropical conditions.

The various sections of the Division of Chemistry also continued to operate almost exclusively on war problems. Continued co-operation with the Directorate of Chemical Warfare and Smoke included studies to improve the pilot plant yields of organic chemicals and syntheses of new toxic materials, while a small group was engaged on fundamental studies of long-range interest to synthetic rubber manufacture. The design of a pilot plant for ethylene oxide was completed and erection begun. Particular attention was paid to catalysts used in the conversion of ethylene to ethylene oxide. In the Plastics and Colloid Section the chief projects related to the study of density-temperature relations of some plastic materials and the physical properties of plastic and plasticizer combinations. The Plastics Testing Laboratory carried out investigations on waterproof maps, testing of safety goggles, the treatment of leather components for use in the tropics, the improvement of sole leather by impregnation with resins and the examination of periscope prisms to determine the reason for bubble formation in the plastic laminating layer. The Textile Section continued its investigations with special attention to rot-proofing technique. Work on protective clothing for the Air Force was a major project; attention was also given to wear resistance and shrinkage of Service socks. At the request of the Army medical authorities, the oiling of blankets was investigated as a method of preventing transfer of infection in hospitals. The Rubber Laboratory again gave special attention to synthetic rubber compounding, and the scarcity of carbon black required work to determine the effect of reducing the proportion in such materials as footwear. Work was also done on non-skid deck covering. In addition to the problems on the tropicalization of vehicles, packaging of metallic parts, etc., the Corrosion Laboratory carried out long-term investigations of sea-water corrosion of alloys and protective coatings, the study of corrosion inhibitors in tap water and in anti-freezes, the testing of rust-preventing oils and preliminary work on the possible cathodic protection of ships.

The Division of Mechanical Engineering devoted almost its full effort to war work for the Armed Services and the Department of Munitions and Supply. The Hydraulic Laboratory and an addition to the Gasolene and Oil Laboratory were completed and occupied. Fundamental research on the aerodynamic balancing of aircraft controls was extended. Special attention was given to the design and construction of artificial limbs in moulded plywood and moulded synthetic resin materials, and many tests were performed on synthetic resin adhesives with particular reference to the technique of metal bonding.

In the Division of Physics and Electrical Engineering the work was largely in the field of marine physics. In the Acoustics Laboratory three major anti-submarine projects were completed. The main effort of the Optics Laboratory was devoted to research in aerial photography; this work was sponsored by the Canadian Photographic Research Committee. Some thirty-five reports were issued but the circulation list was restricted by security regulations. It can be expected that a new basis for the design of photographic objectives will be developed and photographic lenses will have a greatly improved performance. Much work has been done on night photography for reconnaissance purposes.

In addition to reports on literature searches, the Research Plans and Publications Section made nearly three times as many translations as in the preceding year. During the year, eighty-eight papers were added to the Council's list of publications, which has now attained such proportions that it has been decided to re-issue the list to include author and subject indexes as well as the numerical chronological list of titles. Among the reports issued during the year may be mentioned abstracts on fungi and bacteria affecting various materials, storage of coal and a revised and enlarged edition of abstracts on penicillin and other antibiotic substances, as well as abstracts on the utilization of sawdust.

CONTEMPORARY CULTURE OF THE CÁHITA INDIANS

THE Cáhita Indians of western Mexico consist of two surviving groups, the Yaqui and the Mayo. As a result of his visits to them, Ralph L. Beals has already published an account of what can be gleaned about their aboriginal culture (*Ibero-Americana*, No. 19, Calif. Univ. Press, 1943). He now shows (*Bull. 142, Bur. Amer. Ethn.*, Smithsonian Instit., 1945) that their modern culture is a vigorous hybrid, which differs from those of the Indians of the United States in that it is holding its own with that of the whites, though it continually absorbs elements from it. It is by no means sure, as the author points out, that the Indian elements in Mexican culture will be altogether lost in the final synthesis.

This useful account sets out to deal particularly with the ethnography rather than the social anthropology of the Cáhita; nevertheless it contains much information about the latter aspect. There is an interesting summary of the material culture, but much of the book is taken up with accounts of the religious observances. Superficially these appear to centre largely around the Christian Church and calendar, but they contain so many aboriginal elements and introduce the Catholic priest so seldom,