

cified areas; one, left frontal; one, right temporal, and a rather irregular area well forward at the vertex. The significance of this finding was not determined in relation to the cephalalgia. The cervical sympathetic nerves were injected in an effort to relieve the pain, but this treatment was only partially successful. The laboratory examinations revealed marked glycosuria and hyperglycemia (fasting blood sugar, 214). A diet containing 1,800 calories and 15 units of insulin three times a day were prescribed. The patient has not returned to the clinic since, and nothing is known of the results of treatment.

CASE 3.—An Italian woman, aged 52, complained that for five years she had not been in good health. Her abdomen had been enlarging steadily; there was burning on urination, and during the last year there had been a coarse tremor of the hands and feet, with some numbness and tingling of the feet. The patient had had seventeen pregnancies, with only four children living and well. A number of pregnancies resulted in abortions or stillbirths, and several children died during the first year of life. The patient was short and obese, and her blood pressure was 150 systolic, 82 diastolic. The parotid glands were symmetrically enlarged. The abdominal wall was relaxed and the abdomen markedly distended. A large mass in the hypochondrium was found to be due to ptosis of the liver. Hemorrhoids had been present for twenty-eight years. A typical pill-rolling position of the hands with a coarse intermittent tremor was noted. The fasting blood sugar was 272 mg. per hundred cubic centimeters, and the blood urea 69 mg. The hemoglobin and red blood cell counts were below normal.

The diagnosis was diabetes, Parkinson's disease, pernicious anemia, Mikulicz's disease, obesity and abdominal viscerotoposis. The diabetes was controlled on a diet of 140 Gm. of carbohydrate, 60 Gm. of protein and 111 Gm. of fat, with 10 units of insulin three times daily, but no change was noted in the size of the parotid glands.

CASE 4.—An Italian woman, aged 68, sought relief from intense itching of the skin, which had begun about a week before and had become progressively worse. Nine months before she had had polyuria and had been told by her family physician that she had diabetes. Her diet had been only slightly restricted and she had received no insulin. The polyuria had disappeared. Her blood sugar was 300 mg. per hundred cubic centimeters and she had severe glycosuria. Aside from moderate obesity, bilateral swelling of the parotid glands was the only significant finding in the physical examination. The skin condition was diagnosed as diabetic dermatitis. On a routine diabetic diet of 1,800 calories and 10 units of insulin twice daily, her blood sugar returned to normal, and she was advised to follow this regimen after she left the hospital. At a subsequent examination, the blood sugar had increased slightly, and the insulin dose was increased to 15 units twice a day, which has controlled the diabetes satisfactorily.

COMMENT

All four of these patients were obese, and there was a striking similarity in their facial appearance. Not one of them has been observed more than a few months, and during that time there has been no diminution in the size of the parotid glands. The diabetes was mild in all these cases and was easily controlled with moderate dietary restrictions and small doses of insulin. Whether the parotid swelling represents a compensatory process brought about by decreased pancreatic function, as Charvát and Flamm have suggested, remains an open question. But these cases are reported with the hope that it may stimulate more clinical observations and more interest in the possible relationship between the salivary glands and the pancreas. At present the problem is largely of academic interest, but further experiments and observation may bring forth knowledge that may be of significant importance clinically.

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VACCINATION AGAINST WHOOPING COUGH

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As vaccination against whooping cough is still much discussed, the following observations might perhaps be of some interest.

The vaccine used in the State Serum Institute in Copenhagen is always made from several recently cultivated strains of Bordet-Gengou bacilli; forty-eight hour blood agar cultures are emulsified in physiologic solution of sodium chloride containing 1 per cent solution of formaldehyde, so that the suspension contains about 10,000 millions of bacilli per cubic centimeter. The vaccine is given in three injections intramuscularly or subcutaneously with intervals of from three to four days: 0.5, 0.7 and 1.0 cc. This dosage is greater than that usually employed.

As generally maintained, one of the advantages of whooping cough vaccination is the absence usually of severe reactions following the injections, although it would seem correct to call attention to two deaths that have occurred in Denmark. In both cases, the children concerned were new-born in families at the time when whooping cough was present. The physician in charge therefore considered it desirable to vaccinate the new-born children. Immediately after birth one child was given 0.1 cc. of whooping cough vaccine, subcutaneously, causing no symptoms, and four days later 0.15 cc. was given. One-half hour after the last injection, contractions in the arms and legs occurred, followed by cyanosis, hiccup, convulsions and death within a few minutes. The other case, occurring two years later, was that of a child weighing 2,250 Gm., born five weeks prematurely. Eight days after birth, 0.1 cc. of whooping cough vaccine was given, causing no symptoms. Three days later, 0.2 cc. was injected (all injections subcutaneously). Two hours after this injection, the child died suddenly with slight cyanosis but no convulsions or vomiting. At the postmortem examination no definite cause of death could be established. No attempts will be made here to explain these two deaths. In spite of the fact that numerous new-born children have been vaccinated without any reactions, we now do not recommend the vaccination of children under 1 month of age.

Furthermore, some of my colleagues have told me that they have seen considerable malaise following the vaccination.

The reason for the difference of opinion concerning the value of the vaccination lies to some extent probably in the fact that no sufficient distinction has been made between the therapeutic and the prophylactic properties of the vaccine. Most of the reports conclude that if given early in the catarrhal stage the vaccine will have a good effect; the later the vaccine is given in the convulsive stage, the less effect can be expected. This appears from the reports of most of the Danish officers of health and also is the consensus of the Danish pediatric society.¹

The greatest difficulty in the appraisal of the effect of the whooping cough vaccination is that no suitable control material is at hand. Such a control material that

From the State Serum Institute.
1. Meyer, A. H.; Kristensen, Martin, and Sørensen, Einar: Whooping Cough Vaccination, *Acta Pædiat.* 4: 21, 1924; abstr., *Ugesk. f. læger.* 91: 1141 (Dec. 12) 1929. Madsen, Thorvald: Whooping Cough: Its Bacteriology, Diagnosis, Prevention and Treatment, Boston M. & S. J. 192: 50 (Jan. 8) 1925.

is especially well adapted in this respect is found, however, in the Faroe Islands.² The conditions peculiar to these islands cause the whooping cough epidemics to appear in waves separated by quite long intervals entirely free from whooping cough. An epidemic of this kind started in 1923 and continued in 1924. On this occasion, vaccination on a large scale was carried out, 2,094 individuals being vaccinated, whereas this was not possible in 627 cases. The result was that the majority of both vaccinated and nonvaccinated individuals contracted whooping cough. As a prophylactic measure, its value, therefore, was not worth mentioning. On the other hand, only five deaths occurred in the vaccinated group as compared to eighteen deaths in the nonvaccinated group. The mortality in the latter group was therefore twelve times that of the former, and the course of the disease was as a whole much more severe in the nonvaccinated individuals.

Detailed information regarding the disease was obtained by Dr. Zachariassen and is summarized in table 1. The earlier the vaccination was carried out, the better was the effect: the best results were obtained when the vaccination was completed one week before the onset of the disease.

Another whooping cough wave appeared in the Faroe Islands in 1929; Dr. Zachariassen was kind enough to give me his observations. This time, vaccination was carried out in 1,832 individuals, while 446 were not vaccinated. A comparison between these two groups is shown in table 2.

In this epidemic the prophylactic value of the vaccination seems to have been much better than in the first one, 458 of the 1,832 vaccinated avoiding whooping cough, whereas among the 446 nonvaccinated only 8 did not become infected.

The explanation of the favorable results of vaccination in the Faroe Islands probably rests on the following facts: 1. The vaccine was made from young strains.³ 2. The dose used was rather large, a total

TABLE 1.—Comparison of Vaccinated and Nonvaccinated Groups

	450 Vaccinated	405 Nonvaccinated
Mild cases.....	410	275
Moderate cases.....	35	90
Severe cases.....	4	27
Fatal cases.....	1	13

TABLE 2.—Analysis of Epidemic of 1929

	1,832 Vaccinated	446 Nonvaccinated
Not attacked.....	458	8
Mild cases.....	1,336	225
Moderate cases.....	29	170
Severe cases.....	8	35
Fatal cases.....	1	8

of 22,000 million bacteria. 3. The vaccination was completed shortly before the onset of the epidemic; i. e., at a time when the titer of antibodies produced by the vaccine is highest.⁴

2. Heerup, H.: Erfaringer fra en Kighostepidemi i Thorshavn Lægekreds August, 1923, til Foraaret 1924. Ugesk. f. læger. **86**: 675 (Sept. 11) 1924. Kofod, S. E.: Nogle Oplysninger om Optraeden af Kighoste i Sandø Præstegaard (Færøerne) 1923-24: Specielt med Henblik paa Anvendelsen af Kighostevaccine, *ibid.* **88**: 585 (June 17) 1926. Rasmussen, R. K.: Om Kighoste og Kighostevaccination i Ejde Lægedistrikt paa Færøerne, *Bibliot. f. læger.*, 1925, p. 130.

3. Gardner, A. D., and Leslie, P. H.: Early Diagnosis of Whooping Cough by the Cough-Droplet Method, *Lancet* **1**: 9 (Jan. 2) 1932.

4. Kristensen, Martin, and Ahrend Larsen, S.: Production d'anticorps après la vaccination contre la coqueluche, *Compt. rend. soc. de biol.* **95**: 1110 (Nov. 5) 1926.

A summary of the results of the two epidemics, 1923-1924 and 1929, both of which occurred during the winter, is shown in table 3.

The mortality in the vaccinated group is therefore one sixteenth of that in the nonvaccinated group. This figure is sufficiently large to prove the usefulness of the vaccination when carried out in time. Furthermore, the disease in vaccinated individuals takes a much

TABLE 3.—Results of Two Epidemics

	3,926 Vaccinated	1,073 Nonvaccinated
Deaths.....	6	26
Percentage.....	0.15	2.4

milder course and is of shorter duration. It is worth mentioning that no selection whatever was made between the vaccinated, so that the nonvaccinated and vaccinated groups of individuals in both epidemics were quite comparable in respect to age, time of epidemic and surrounding conditions.

LIVER-GASTRIC TISSUE PREPARATIONS IN THE TREATMENT OF PER- NICIOUS ANEMIA

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The therapeutic effectiveness of liver and fractions of liver in the treatment of patients with pernicious anemia is well established. Minot, Cohn, Murphy and Lawson,¹ and Zerfas² have demonstrated that the amount of liver extract No. 343 derived from 300 Gm. of whole liver (from 12 to 14 Gm. of the dried powder) is the minimal amount required to produce maximal reticulocyte responses when fed daily by mouth to patients with pernicious anemia in relapse. Sharp,³ Sturgis and Isaacs,⁴ Conner,⁵ Wilkinson⁶ and others have shown that preparations of hog gastric tissue are likewise effective when fed daily in amounts equivalent to from 200 to 300 Gm. of fresh stomach tissue (from 30 to 40 Gm. of desiccated material). Following the work of Castle and his associates,⁷

From the Lilly Laboratory for Clinical Research, Indianapolis City Hospital, and the Department of Medicine, Indiana University School of Medicine.

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2. Zerfas, L. G.: Liver Extract for Pernicious Anemia: Blood Changes During the First Month; Report of 101 Cases, *Arch. Int. Med.* **47**: 135 (Jan.) 1931.

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5. Conner, H. M.: The Feeding of Gastric Tissue in the Treatment of Pernicious Anemia, *J. A. M. A.* **96**: 500 (Feb. 14) 1931.

6. Wilkinson, J. F.: Pernicious Anemia: Preliminary Report of Results Obtained by Treatment with Certain Preparations of Stomach, *Brit. M. J.* **1**: 236 (Feb. 8) 1930.

7. Castle, W. B.: Observations on the Etiological Relationship of Achylia Gastrica to Pernicious Anemia: I. The Effect of the Administration to Patients with Pernicious Anemia of the Contents of the Normal Human Stomach Recovered After Ingestion of Beef Muscle, *Am. J. M. Sc.* **178**: 748 (Dec.) 1929. Castle, W. B., and Townsend, W. C.: Observations on the Etiological Relationship of Achylia Gastrica to Pernicious Anemia: II. The Effect of the Administration to Patients with Pernicious Anemia of Beef Muscle After Incubation with Normal Human Gastric Juice, *ibid.* **178**: 764 (Dec.) 1929. Castle, W. B.; Townsend, W. C., and Heath, C. W.: Observations on the Etiological Relationship of Achylia Gastrica to Pernicious Anemia: III. The Nature of the Reactions Between Normal Human Gastric Juice and Beef Muscle Leading to Clinical Improvement and Increased Blood Formation Similar to the Effect of Liver Feeding, *ibid.* **180**: 305 (Sept.) 1930.