

our laboratory methods are crude means to detect chemical and physicochemical changes taking place in the cells of the body after infection.

As a diagnostic aid, the positive Wassermann reaction still stands as our greatest aid and a tremendous step forward in the uncovering of syphilis. It has long been taught, and until recently we shared with others the belief, that the goal to be attained in the treatment of syphilis is the conversion from a positive to a negative phase in the blood test. We are fast being converted to the view that, excepting in the small group of early cases in which positive tests are never elicited and the cases are aborted, to attempt this end is, as it were, chasing a shadow.

Until more is known about the nature of this reaction, as to whether it is caused by antibodies or immune substances, it seems to us that there is equally less justification to attempt or to expect well established positive cases to become permanently negative.

We are convinced that in the presence of an intensive therapy, a positive test does not necessarily mean living spirochetes and potential syphilis any more than a positive tuberculin test in an individual who has had tuberculosis would indicate the presence of living tubercle bacilli.

With the ever increasing discrepancies reported with each refinement of the Wassermann test; with the ever

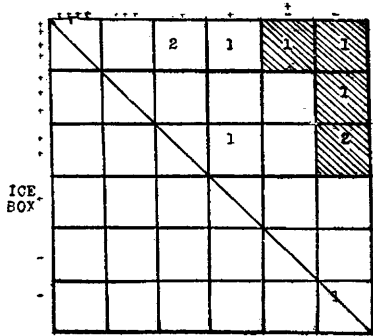


Chart 10.—Ten treated cases of latent syphilis after treatment: Shaded figures (five cases) would be considered as cured on basis of old Wassermann test.

increasing number of permanently positive cases, previously regarded negative, it appears to us that as a guide to therapeutics, the Wassermann reaction does not have a leg to stand on.

We stand today, with regard to the criteria of the treatment and cure of syphilis, as did the syphilologists of the pre-Wassermann day.

Until recently we have taught, as have all others, and have impressed on patients, that treatment must be continued until the blood no longer shows evidences of syphilis. Undoubtedly we, as all others, have passed, as cured, cases which have been recorded as negative, depending on the degree of delicacy of the test at the time. We do not feel that these cases are necessarily not clinically cured, although modern tests would show many surely as positive.

Whatever intensive treatment has been directed toward the eradication of the Wassermann reaction has undoubtedly been well directed toward the eradication of the disease.

In the light of our real ignorance of the nature of the reaction, particularly in the interpretation of late persistent tests, we submit that serologic and clinical cure are not necessarily parallel. Energy of treatment directed toward the end of attempting to make a persistent positive react negatively may well be not only useless but misdirected.

**The Laborer's Health.**—On the health of the nation depends the efficiency of labor, and the economic value of the laborer is one of the arteries of commerce.—Arthur E. Holder.

SUGAR TOLERANCE IN CANCER\*

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The insidious onset of a malignant tumor with the lack of positive evidence, in the majority of instances, until the case is far advanced, is perhaps the greatest difficulty in the way of a decided reduc-

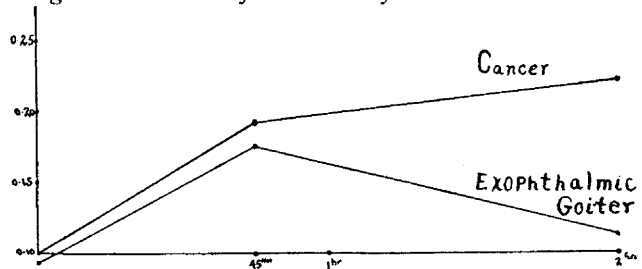


Chart 1.—Comparison of the curve of sugar tolerance in exophthalmic goiter and in cancer. In this and in the subsequent charts the ordinates give the sugar percentages per hundred c.c. of blood, while the abscissas indicate the zero hour, forty-five minutes, and one and two hours, thereafter.

tion in cancer mortality. Certain well established facts of cancer etiology may be briefly stated in order to explain the basis of the experiments of which this paper constitutes a preliminary report.

Broadly speaking, the development of malignant tumors rather frequently follows irritation, though no irritant is specific. It is generally accepted that not every one exposed to the action of any given irritant develops a tumor. In other words, there is an apparent predisposition as well as an actual inciting irritant. Again, broadly speaking, since exact statements are not possible in the present state of our knowledge, this predisposition becomes more evident at a certain period in life, a period spoken of as the cancer age, and demonstrable in animals as well as man.<sup>1</sup> Not a few investigators have attributed cancer development to faulty function of the endocrine glands, one or the other gland being held responsible. So far there has

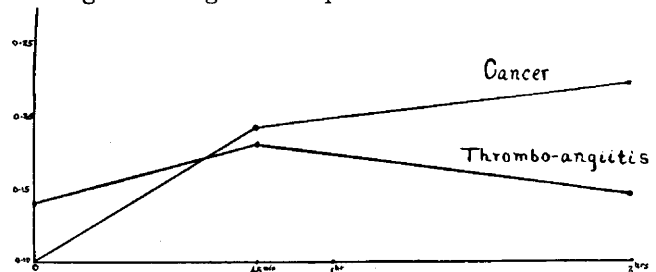


Chart 2.—Comparison of the curve of sugar tolerance in thrombo-anginitis and in cancer.

been no positive evidence produced that will support this hypothesis. There are no specific lesions demonstrable in the endocrine glands of mice with spontaneous tumors<sup>2</sup> nor does extirpation or the feeding of one or more of these glands have any apparent influence on the rate of growth, infectivity, or immunity against animal tumors.<sup>3</sup>

\* From the Pathological Laboratories of the Lenox Hill Hospital.

1. Murray: Proc. Roy. M. & Chir. Soc., Series B, 84: 42, 1911-1912. Slye: J. Cancer Res. 1: 479, 1916.  
2. Rohdenburg and Bullock: J. Med. Res. 33: 147, 1915.  
3. Rohdenburg, Bullock and Johnson: Reports of George Crocker Special Research Fund 3: 87, 1913.

Nevertheless, it is possible that there may be derangement of endocrine function not demonstrable by histologic or surgical technic. The functional activity of some of the endocrine glands can, to some extent, be measured by the sugar tolerance test first brought into clinical use by Jacobsen<sup>4</sup> in 1913. With this method Janney and Isaacson<sup>5</sup> have demonstrated that the removal of the thyroid in dogs is followed by a hypoglycemia. Other clinicians have applied the test in a variety of conditions, among which may be mentioned diabetes, nephritis, exophthalmic goiter, pituitary disease, myxedema and thrombo-angiitis obliterans. In some of these diseases typical curves of no inconsiderable value in diagnosis have been established though unfortunately not applied clinically with the frequency which the importance of the data so obtained warrants.

Following the method as outlined in a succeeding paragraph we have obtained values apparently constant in cancer, which may ultimately prove of value in diagnosis. It is for this reason that a preliminary report is made.

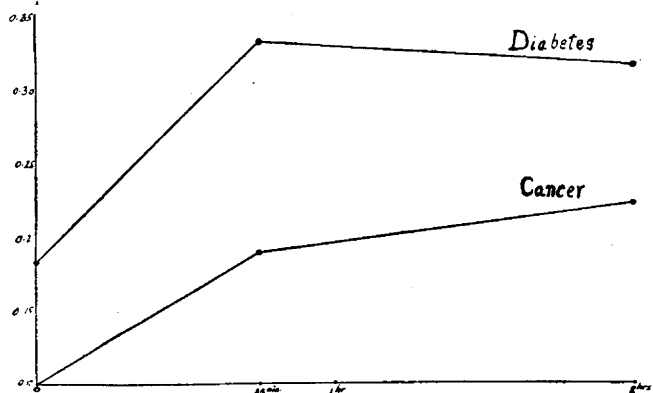


Chart 3.—Comparison of the curve in diabetes and in cancer. Note that the diabetic curve starts at a higher point and commences to fall at the second hour, whereas the cancer curve does not.

TECHNIC OF THE TEST

In the morning, after a night's fast, the individual is given either 100 gm. of anhydrous or 115 gm. of syrup glucose dissolved in 300 c.c. of tea or coffee without milk or sugar, care being taken that the glucose is all dissolved and that the patient takes the entire amount. Just before giving the glucose, and again forty-five minutes and two hours after its ingestion, blood is withdrawn and the amount of sugar in it is determined by the method of Lewis and Benedict as modified by Meyers. At the same time periods the urine is qualitatively examined for sugar by the method of Benedict.

The epinephrin method may also be employed by giving 1 c.c. of a 1:1,000 solution of epinephrin hydrochlorid subcutaneously instead of administering glucose. All other manipulations are identical with the glucose procedure.

The normal curve of sugar tolerance as well as the curve in some diseases other than cancer is graphically portrayed in Charts 1, 2, 3 and 4 and needs no amplification here.

The cancer curve in contrast to the curve observed in other diseases starts with a normal blood sugar, 100 mg. per hundred c.c. of blood; rapidly rises so that forty-five minutes after the ingestion of glucose

180 or even 200 mg. per hundred c.c. are present, and two hours after the glucose is ingested the blood sugar is either as high as at forty-five minutes or higher, reaching 288 mg., and in one instance 350 mg. per hundred c.c. of blood. The percentage of blood sugar gradually falls and approximates normal in from three to four hours after the ingestion of the glucose. The average of four curves in which specimens of blood were taken up to three hours is shown in Chart 5. This curve was present in our limited experience in twenty-four cases of carcinoma and one of sarcoma

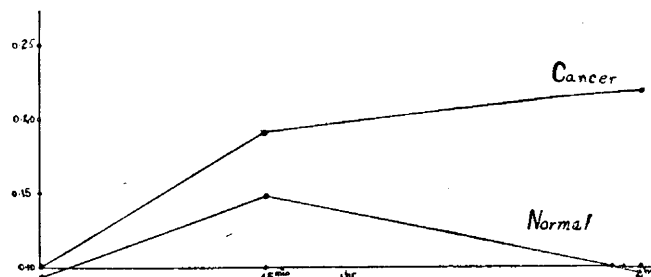


Chart 4.—Comparison of the cancer curve with the curve in normal individuals.

and does not occur in some forty cases of other diseases which we have examined. The curve covering the use of epinephrin instead of glucose is identical with the curve following the ingestion of glucose.

The sugar present in 100 c.c. of blood at the zero hour and at forty-five minutes and two hours after ingestion of glucose as it occurred in twelve cases is presented in the accompanying table. The sugar tolerance bears no relation to the location of the tumor, for primary carcinoma of the lung, carcinoma of the sigmoid, of the stomach, and of the breast and other organs, all give the same type of reaction.

Even with the high blood sugar present in these cases, sugar appeared in the urine rather infrequently, only 41 per cent. of the cancer cases showing sugar.

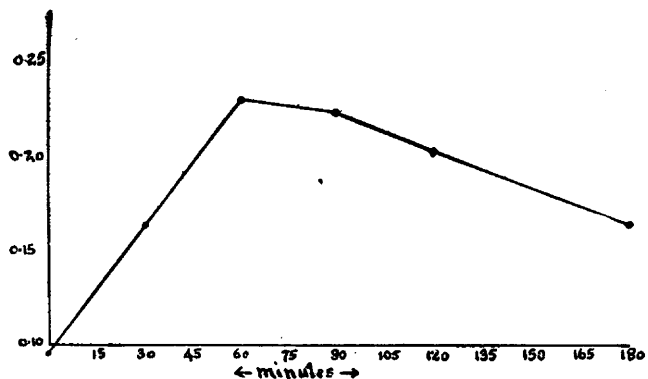


Chart 5.—Cancer curve based on four cases. The abscissas indicate the time period in minutes.

The value of the test is well shown in two of the cases of the series. Others could be quoted but these serve the purpose:

CASE 1.—A man, aged 47, about three years before admission to the hospital had, without apparent reason, commenced to cough, having had no previous pneumonia, pleurisy, nor other pulmonary condition. This cough persisted. In one hospital a diagnosis of probable lung abscess was made, possibly because of the type of sputum and the accompanying temperature. This abscess was thought to be possibly of tuberculous nature, though this could not be positively asserted. He then went to a sanatorium for tuberculosis where the diagnosis of bron-

4. Jacobsen: Biochem. Ztschr. 56: 471, 1913.

5. Janney, N. W., and Isaacson, V. I.: The Blood Sugar in Thyroid and Other Endocrine Diseases, Arch. Int. Med. 22: 160 (Aug.) 1918.

chiectasis was made. He was then referred to Dr. Willy Meyer for operation. An exploratory puncture of the supposed bronchiectasis was made and pus was found. Operation immediately followed puncture and a pus sac was drained. Previous to puncture, roentgenograms showed a thickened pleura. The sugar tolerance curve was characteristic of tumor. The patient survived operation three days. At necropsy an adenocarcinoma arising from the bronchial epithelium was found. The tumor measured approximately 5 cm. in diameter and partially compressed the bronchi of the right lung, causing aneurysmal dilatation of the bronchi.

In contrast to this case, a second would appear to illustrate the value of a negative curve:

CASE 2.—A woman, aged 55, gave a typical history of gastric carcinoma situated at the pylorus. A roentgenogram disclosed almost complete obstruction at the pylorus and according to the roentgenographer a new growth was present extending from the pylorus toward the cardia, involving approximately the distal third of the stomach. Gastric analysis showed no hydrochloric acid. Lactic acid was present and Boas Oppler bacilli and blood were present. The sugar tolerance curve was that of a normal individual. After operation the blood gave a Wassermann ++++. At operation, the entire pylorus, as well as the involved portion of the stomach wall, was resected. Microscopic examination failed to show any evidence of cancer, but did show a typical gumma and the perivascular round-cell infiltration of syphilis. Spirochetes were not demonstrable.

SUGAR PRESENT AT VARIOUS TIME PERIODS BEFORE AND AFTER INGESTION OF GLUCOSE

| Diagnosis                  | Blood Sugar    |               |       | Urinary Sugar  |               |       |
|----------------------------|----------------|---------------|-------|----------------|---------------|-------|
|                            | Before Glucose | After Glucose |       | Before Glucose | After Glucose |       |
|                            | %              | 45 Min.       | 2 Hr. | %              | 45 Min.       | 2 Hr. |
| Carcinoma of stomach....   | 0.120          | 0.144         | 0.232 | 0              | 0             | 0.3   |
| Carcinoma of stomach....   | 0.108          | 0.228         | 0.288 | 0              | 0             | 2.0   |
| Carcinoma of stomach....   | 0.114          | 0.240         | 0.272 | 0              | 0             | 0     |
| Carcinoma of stomach....   | 0.106          | 0.100         | 0.192 | 0              | 0             | 0.9   |
| Carcinoma of uterus....    | 0.138          | 0.174         | 0.164 | 0              | 0             | 0     |
| Carcinoma of sigmoid....   | 0.123          | 0.158         | 0.189 | 0              | 0             | 0     |
| General carcinomatosis ... | 0.096          | 0.204         | 0.215 | 0              | 0             | 0     |
| Carcinoma of stomach....   | 0.116          | 0.168         | 0.230 | 0              | 0             | 0     |
| Carcinoma of stomach....   | 0.078          | 0.215         | 0.210 | 0              | 0             | 0     |
| Carcinoma of esophagus...  | 0.082          | 0.160         | 0.220 | 0              | 0             | 0.7   |
| Carcinoma of stomach....   | 0.120          | 0.240         | 0.156 | 0              | 0             | 0     |
| Carcinoma of stomach....   | 0.103          | 0.275         | 0.245 | 0              | 0             | 1.0   |
| Sarcoma of femur.....      | 0.980          | 0.170         | 0.220 | 0              | 0             | 0     |

We prefer for the present not to theorize on the etiologic significance of the phenomenon so far observed; the possibilities are numerous, and theoretically one explanation is as good as another, nor shall we at this time venture an explanation of the mechanism of the occurrence, contenting ourselves rather with recording the phenomenon so that repetition in other hands than ours may more rapidly prove or disprove its value as a diagnostic test.

**Defective Development of the Blood.**—Pittaluga's term, "hemodystrophies," has been widely adopted to indicate defective formation of blood and the evils resulting therefrom. The biochemical alterations may predominate over the histopathologic, and there may be a more or less accentuated neuropathic factor, direct or indirect, through the mediation of the glands of internal secretion. Hereditary or familial factors may intervene directly or indirectly. Purpura, hemophilia, hemolytic jaundice, hemoglobinuria and the hemorrhagic diathesis can all be classed in the four main groups of the hemodystrophies: those with a hemorrhagic diathesis, with a tendency to polycythemia, to chlorosis, and the diathesis showing a tendency to eosinophilia. As he describes in the *Siglo Medico*, Nov. 16 and 23, 1918, pp. 939 and 956, these hemodystrophies reveal an intimate connection between the blood-producing organs and the endocrine system, and show the important part played by heredity.

## THE NOSTRUM AND THE PUBLIC HEALTH\*

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Broadly speaking, the nostrum belongs in one of two general classes; one class comprises those unscientific mixtures that are advertised primarily to the medical profession, and first reach the public by way of the prescription; the other class includes those mixtures that are sold direct to the public. Nostrums in the first class are sometimes spoken of as "proprietary"; those in the second class are colloquially known as "patent medicines." The public suffers from both classes, the only difference being that in the case of the former the physician has to share the responsibility with the nostrum exploiter. There is no clearly defined line of demarkation between these two classes. Many of the "patent medicines" of today were the "proprietary" of yesterday. Shrewd manufacturers—or, more correctly, exploiters, for many of these products are not manufactured by those that sell them—discovered years ago that one of the least expensive methods of introducing a nostrum to the public was by way of the medical profession. After the profession had been widely circularized and much space bought in the advertising pages of medical journals of a certain type; after uncritical or unthinking physicians had prescribed the products (of course in the "original package" with the name blown in the bottle or a monogram stamped on the tablet); after the patient had learned with disgust that his physician had merely prescribed a "patent medicine" that could more cheaply have been purchased direct—then the one-time "proprietary" threw off its "ethical" mask and became frankly a "patent medicine." Such has been the genesis of many a "patent medicine" on the market today. Others, less deviously, have gone directly to the public at the outset.

### FEW, IF ANY, REAL PATENT MEDICINES

The present paper deals with the "patent medicine" evil. Correctly speaking, there are practically no true patent medicines on the market; first, because few if any of the products of this type could be patented, and second, because patency or openness is the last thing the average "patent medicine" seller wants. Mystery and secrecy are his great assets. A product to be patentable must, according to the law—not always enforced, by the way—represent something new and useful; and this requirement of the patent law rules out the "patent medicine." A patent when granted gives the owner a legal monopoly on his product for seventeen years, after which time the product becomes public property. The "patent medicine" seller finds it easier and far more profitable to put together a simple mixture of drugs that represents nothing either new or useful, to which he gives a fancy name, and obtains a trade-mark on that name. The trade-mark gives him a perpetual monopoly to the name and places no restrictions on the composition of the product; nor, in the granting, is he required to give any information regarding its composition.

Thus "Winslow's Soothing Syrup" is still "Winslow's Soothing Syrup" in name, although the product

\* Read before the Chicago Medical Society, March 26, 1919.