

It has occurred to me that possibly the contraction of the muscle may give rise to pain or inconvenience. Inasmuch as by all the older methods, the effort has been made to effect as close an organic union as possible between the kidney and the deep lumbar muscles and fascia, and the more close the union the better the results were considered, I can see no objection to the method here proposed.

After writing the above, I found in the *New York Medical Journal* of Dec. 7, 1901, a short article by Carl Beck, New York, "On a New Principle in Nephropexy," which I take the liberty of quoting: "The principle of this—as it seems to me—new procedure consists in suspending the kidney after having buttonholed it, on the fibers of the nearest muscle. I may be permitted to give the following preliminary report: In a woman of 24, the right movable kidney, after being exposed by a lumbar incision, was perforated near its lower pole by a trocar of moderately large size, a procedure which caused but little hemorrhage. The margin of the spinalis dorsi muscle was incised then and a bunch of fibers, just large enough to pass the renal buttonhole, mobilized. By a Pean forceps, this hand-like muscular flap was drawn through the renal hole made by the trocar. Then the end of the flap was fastened somewhat below its former muscular bed by iodoform-silk sutures. Thus the kidney was held *in situ* only by living tissue. There was no reaction and the operation seems to be a success."

The principle of this method is the same as my own, an effort to hold the kidney in its fixed position by living muscular tissue. But in my method there is, first, not so much traumatism to the kidney substance as in Beck's; second, in my method the muscular fibers are none of them cut, but remain intact and able to perform their functions as before.

NOTE.—After the publication of an abstract of this paper I received a reprint of an article published in the *Medical Record* by Dr. J. F. Baldwin of Columbus, Ohio. I had not heard of his method of anchoring the kidney and his article had been overlooked. My method is so similar to his that I am glad at this time to acknowledge his priority, though the method devised by me was entirely independent of his work along this line.

B. B. D.

THE WORK OF THE DIGESTIVE GLANDS (PAWLOW) AND ESTIMATION OF PEP- SIN DIGESTION BY MODERN IN- STRUMENTS OF PRECISION.

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One of the most noteworthy contributions in the line of investigations of the digestive process is without doubt Pawlow's recent book, "The Work of the Digestive Glands." It is originally written in Russian and translated into German by Dr. Walter, "Die Arbeit der Verdauungsdrüsen."

An English translation has not yet appeared; it may not, therefore, be out of place to mention briefly some of Pawlow's main achievements. He resorted to an original method of research by forming a sack from part of a dog's stomach, fastening it outside the abdomen and taking care to keep the innervation perfectly intact. Processes going on in the stomach could be observed in the sack without being interfered with by the presence of food. He found that there exists a perfect relation between the amount of food taken and the quantity of gastric juice secreted; the more food, the more juice.

The secretion of gastric juice and pancreatic juice

occurs in the form of a curve gradually increasing and then decreasing. The glands furthermore produce a juice of a different chemical composition with more or less pepsin ferment or with a variable amount of different ferments as is the case in the pancreatic gland. On the other hand, the degree of acidity of the gastric juice is constant and does not vary. Oscillations occur with an increased quantity of the juice and with neutralization by mucus. A specific action of the gastric glands is observed after a mixed diet as well as after feeding on a single article of food. This specific action pertains to the properties of the juice, to its quantity, its course and duration of secretion. After eating bread the juice shows the greatest peptic strength; next in order comes meat and at last milk. The so-called gastric bread-juice contains four times as much ferment as gastric milk juice and is four times as concentrated.

The acidity is highest for meat and lowest for bread. The hourly intensity of the work of the glands is about the same for milk as for meat and is much smaller for bread. But bread requires a longer time for work. A characteristic change in the properties of the juice takes place with every variety of food. Also a certain hourly process of secretion is observed to correspond to the kind of food ingested. With meat there is a maximum of secretion during the first or second hour, the quantity of juice being alike in both hours. With bread there is a maximum during the first hour, and with milk during the second and third hour. The juice is strongest during the first hour after meat has been taken, after bread during the second and third, and after milk it becomes strongest after the third hour. After bread a more concentrated juice is secreted, thus avoiding an increase of the quantity of the juice and thereby an excess of HCl. The total quantity of juice after bread diet is not much larger than after milk, but it is extended over a much longer time, so that the hourly amount of juice after bread is one and one-half times less than after milk or meat. HCl, as is well known, would prevent the conversion of starch.

In order to obtain pancreatic juice a piece of the duodenum containing the pancreatic duct was sewed into the abdominal wound.

The pancreatic juice varies like the stomach juice in regard to its quantity. It contains its three ferments in different percentages after different foods. Milk pancreatic juice has the largest amount of albumin ferment, whereas there is less in bread and meat pancreatic juice.

Amylolytic ferment shows the highest figures in bread juice, less in milk and meat juice. But bread pancreatic juice contains less fat ferment, while milk juice is rich in fat ferment. Meat pancreatic juice holds a medium position.

Vegetable albumin calls for the largest amount of ferment from the pancreatic gland as well as from the stomach, whereas milk albumin calls for little. The stomach pours a concentrated ferment over the bread, the pancreas a very diluted one.

Without any doubt there is a distinct adaptation of the juice to the food. Starchy food gets more amylolytic ferment and fatty food more fat ferment.

The next part of Pawlow's work shows that the nervous vagus possesses secretory fibers for the stomach and pancreas. At the same time, it also has an inhibitory influence. Pawlow proved furthermore that after cutting the esophagus and feeding the dog, a flow of gastric juice occurred just as if the food had reached the

stomach. This flow, however, did not occur after the cutting of the *nervi vagi*. If the dog with a cut *esophagus* is fed on stones, sand, acids, etc., no stomach secretion takes place. This proves that the appetite, the desire for food and the feeling of satisfaction during its consumption helps to promote the flow of gastric juice. This flow occurs even when the meat is only shown to the dog but is not actually swallowed by him. Appetite is the equivalent of a certain quantity of gastric juice at the beginning of the meal.

The continuance of the flow of gastric juice is not a simple result of mechanical irritation. Meat juice, bouillon and extract of meat proved to be powerful promoters of secretion, and to some extent even water had its influence. When bread or eggs are eaten without appetite, they lie like stones in the stomach without any digestion taking place. The appetite-juice is the initiative of the secretory process; this first juice produces the setting free of chemical substances contained in the albumin of the bread and has the same effect as meat extract, etc. Those extractive substances cause the further flow of gastric juice and finish the digestion. Fat diminishes the flow and the digestive power. Egg albumin alone and starch alone do not cause any secretion of gastric juice.

With the exception of the psychic secretion, the secretory work is a reflex act in which the promoters of secretion irritate the peripheral ends of the centripetal nerves. HCl causes the flow of the pancreatic juice by reflex action as soon as it appears in the duodenum. Starch does not stimulate the pancreatic secretion but increases the percentage of amylolytic ferment. Fat promotes secretion of pancreatic juice and increases the percentage of fat ferment. Sleep does not inhibit the action of the pancreas. Water produces a distinct secretion in the pancreas as well as in the stomach. Alkalies diminish the pancreatic secretion. Pawlow explains the action of *amara* (bitters) as appetizers. Table decorations, pleasant odors of the food, etc., are helpful as appetizers. Food as well as water must have a pleasing appearance, flavor and taste in order to cause psychic digestion.

Bouillon as a first course is the most important chemical promoter of secretion. Acid as medicine promotes pancreatic secretion. Milk is an exceptionally good food because it needs an extremely low degree of digestive work. Alkalies retard digestion, thereby producing times of rest for otherwise continually working organs.

Pawlow published about a year ago a second paper: "The Experiment as a Timely and Uniform Method of Medical Investigation." Again, he emphasizes the complete adaptation of the work of the digestive glands to the food. In regard to the salivary glands, he found that the mucin glands secreted a thin watery saliva with only traces of mucin upon the introduction of any indigestible substance, whereas eatable things caused the secretion of a more tenacious saliva with much mucin in order to make the food slippery. Further, the drier the food, the more saliva there is. Stones, ice water, etc., will not promote saliva. No purely mechanical or chemical stimulus will promote saliva. But give the dog sand or acids and large quantities of saliva will flow because the sand can not be swallowed otherwise and the acids will not be diluted without it.

Pawlow speaks of a psychology of the salivary glands. By sentiments, wishes and thoughts, often almost unconsciously, we influence the constant physiologic functions of the body. Water, acids, raw eggs and cooked starch

do not influence the flow of bile, but fat increases the amount of bile, as do the extractive substances of meat and the products of albumin digestion. The value of the bile lies in the fact that its addition doubles and triples the action of the pancreatic juice. It is especially the fat ferment which thus becomes strengthened. Bile stops the action of pepsin. Pepsin is dangerous to the ferments of the pancreas. Bile favors the action of the pancreas; it introduces the intestinal digestion. The juice of the smaller intestines proved to be an additional help to the action of the pancreatic juice; it increases the action of all the ferments, but especially that of the albumin ferments. The acid foods having passed the pylorus, produce by reflex a temporary closing until they have become neutralized. Those evacuation movements cease while the dog is actually feeding or has food shown him.

Catarrh of the stomach, experimentally produced by nitrate of silver solutions, showed a condition of asthenia and irritable weakness. The production of gastric juice was at first higher than normal and later on much lower. The average juice production was only two-thirds of the normal. The gland is made irritable and tires more readily. Pawlow recommends, therefore, according to his findings, the use of meat extracts and alkalies.

Before considering the results of Mett's method of determining the amount of pepsin digestion by means of capillary tubes, I would like to briefly mention the method of Hammerschlag: Fifteen grams of albumin are dissolved in 1000 c.c. of warm water and filtered. Then HCl is added until 100 c.c. contain 0.394 HCl (18 c.c. of HCl P.G. to one quart). Use two Esbach tubes, mix 10 c.c. of Hammerschlag's solution with 5 c.c. of gastric juice. Take 10 more c.c. of Hammerschlag's solution and mix with 5 c.c. of water. Fill each tube to the letter U; place the tubes for one hour in the incubator; then fill the tubes to the letter R with Esbach's solution; let the tubes stand for 24 hours. The difference in the amount of precipitated albumin corresponds to the amount digested.

Schüle, Gintl, Kövesi, Troller, Bachmann and Schiff have published their experience with this method. There have been several criticisms of this method, all of which have been repulsed by Schiff. Yet there is no doubt that the method can only have the value of an estimation. In cases of very feebly digesting juices, the presence of albumin in the gastric juice itself will give too high a figure, so that a weak digestive power will not be recognized. Schiff admits this.

The normal figures showing the percentage of pepsinogen with Hammerschlag's method and according to various authors are as follows: Gintl, 85-96 per cent.; Troller, 75.90 per cent.; Schiff, 60.68 per cent.; Schüle, 44.78 per cent.; Kövesi, 50.60 per cent. The opinion of Gintl in regard to the pepsinogen secretion is as follows: "A decided diminution of the value of free HCl to zero and even to negative values does not necessitate a similar condition of pepsin. With a deficit of HCl, there can yet be a comparatively high value of pepsin. He finds no characteristic pepsin secretion in ulcers, cancer, etc. Values from zero to normal may be found under these circumstances.

Kövesi finds between HCl and pepsinogen secretion there is no parallel. In sub- and an-acid juices, the quantity of the pepsinogen with few exceptions is smaller, but not quite proportional and adequate to the quantitative diminution of HCl. Destructive processes of stomach tissue influence the pepsinogen secretion less

than that of HCl. He finds the pepsinogen secretion normal in ectatic and atonic conditions but not in cancer. Troller says: In cases of chronic anacidity we can yet find a moderate pepsin and rennet production. Schiff considers that there is no parallelism between HCl and pepsin secretion. The latter is able to resist disease much longer than the secretion of HCl. In hypo- and ana-chlorhydria he finds no parallelism. His three cases of achylia gastrica simplex showed no pepsin digestion. In cases of cancer he always found severe diminution of pepsinogen production. In hyperchlorhydria he found normal, not increased values of pepsin. If we do not consider minor differences, we find that all investigators begin to realize that HCl secretion differs from pepsinogen secretion. The former is much more oscillating. We now speak of a pepsin question.

Pawlow's assistants do not make use of Hammer-schlag's method. They prefer that of Mett, which I wish to describe here in Pawlow's own words: "The methods used for analysis of the digestive juices were as follows: The albumin digestive power of the juice was tested according to Mett. This method has been perfected in our laboratory and has since been in constant use. Glass tubes with a lumen of 1-2 mm. are filled by suction with liquid egg albumin, which is then coagulated at a temperature of 95 C. Then the glass tube is cut into small pieces; these are soaked in 1-2 c.c. of the liquid which is to be tested. These preparations are placed for 10 hours in a thermostat at the temperature of 37 or 38 C. If the albumin dissolves, this process occurs at the two ends of the glass tubes. At the end of the 10 hours, one measures by the aid of a millimeter scale and a low-power lens, the length of the entire tube and the length of the column of coagulated albumin which has not been digested. The difference in numbers expresses in millimeters, or its fractions, the length of the digested albumin column. This method leaves nothing to be desired in facility of its use, objectivity and a precision of its results. Special experiments by Dr. Ssamojloff have shown that the digestion of the albumin columns within the first 10 hours by using the juices at our command, corresponded absolutely with the duration of the digestion proper. This was the case even if the juice had the greatest digestive power. This experiment weakens the very natural suspicion that the digestion of albumin in the glass tube could not take place with equal rapidity at the different depths of the tube, owing to the greater or smaller collection of digestive products filling the lumen. Consequently we obtain an accurate measure of the digestive power of the different juices by the length of dissolved albumin in the cylinder at the same given time.

Borissow in making his experiments in the laboratory of Professor Tarchanoff with this method clearly proved the underlying relation existing between the length of the digested albumin cylinder and the amount of pepsin contained in the examined juice. The following law resulted. In the digestive juices under observation the quantity of pepsin is like the square of the rapidity of digestion, that is, like the square of the millimeters of albumin cylinder, which were dissolved in equal time by the juices. We will illustrate this law by an example. If one juice has digested 2 millimeters and the other during the same given time, 3 millimeters, the relative quantities of pepsin of these juices are not expressed by figures 2 and 3, but by their squares, namely, 4 and 9. The difference is clear; according to the millimeter scale calculation, the second juice would

contain one and one-half times more ferment than the first; according to our law, however, in taking the square of the digestive numbers the second juice is two and one-quarter times stronger than the first. Naturally many experiments have been made with exact artificial pepsin solutions before deducting the above law.

Borissow arrived at his conclusions independently of Schutz, who had published before him his experiments, which, although entirely different, yet gave the same result. Schutz made polarimetric determinations of quantities of pepsin as resulting from the digestion of albumin. The absolute similarity of the results with such entirely different methods of investigation furnish a guarantee of the exactness of this law. Here I wish to express my regret that the method of Mett, although published and advocated as long ago as 1889, has not yet found the widespread use and appreciation which it so well deserves. How easily could it be made the universal method of determining albumin-digestive ferments, in order to make all experiments with these ferments capable of comparison, and no one will deny that this would be highly desirable.

With such a universal method, all juices of the different animals or men could be represented by a universal scale, and this might lead to important conclusions relative to the oscillations of ferments of different individuals, species and genera. We have yet to state that with Mett's method, the different diameter of the lumen of the glass tube is without consequence, and also that egg-albumin is of sufficiently stable composition to warrant its use as a test effect.

Linossier, who has examined the Pawlow-Mett method carefully to test its usefulness, considers it by far the best. He does not think the fine subdivisions of the scale into 0.01 mm. desirable, and prefers a scale indicating only 0.5 mm. Of the egg albumin he only uses the more liquid portion. For the closing of the glass tubes he recommends paraffin.

Roth allows the juice to work on the albumin for 24 hours. As shown above, Pawlow gives good reasons for preferring 10 hours; Schiff, therefore, criticises Roth's results, which are: average duration of digestion 4.5-5 mm. He does not agree with Pawlow and Linossier in pronouncing the method absolutely exact; yet he admits that it gives the best results. Oscillations of 2 mm. maximum are rare. His objection to Hammer-schlag's method is that differences of one-half pro mille can be the fault of the method as well as the result of correcting the digestion. With Mett's method 0.1 mm. shows digestion beyond any doubt. Roth also admits that the digestion is only, very generally speaking, proportionate to the quantity of HCl, yet there are cases of sub- and an-acidity with a comparatively better pepsin digestion, although Oppler states the contrary.

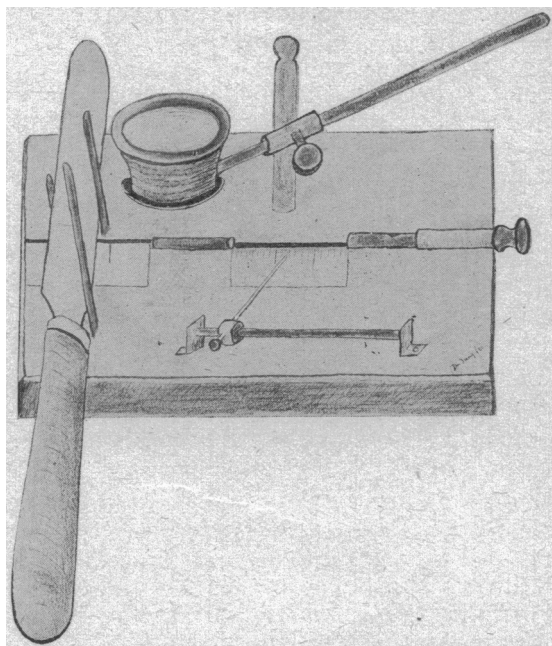
Roth found juices which surpassed the normal digestion. In three of his cases, this was the only pathologic finding to account for the dyspeptic symptoms. This author states that uncomplicated cases of hyperchlorhydria show no special increase of pepsin, yet two of his values for superacidity lie above the normal maximum. For purposes of therapy, Roth considers the method of Mett of importance. In order to improve the digestive values, he tried to give the normal acidity to the juices under examination, but he did not succeed in all cases and Schiff blames the method.

I would like to state here concerning the cases enumerated, that all figures of atrophic catarrh (7), all those of gastritis chronica (4) with only one exception

(3), all figures of carcinoma (15) with one exception (14), are either raised or not altered. All gastric crises are altered until correct (5), and in 17 atonies there are only 4 mistakes (13). I would say that in superacidity, we are not able by the mere addition of alkalines to raise or diminish the figures of pepsin. This corresponds to the recently discovered fact that the pepsin digestion need not correspond to the values of HCl.

Roth gave in 18 out of 94 cases Hammerschlag's figures, but he drew no comparison, and says that an accurate comparison can not be made since Hammerschlag's method is only one of estimation. I believe Dr. Schorlemmer of Berlin will soon publish a series of comparative pepsinogen estimation with both methods, which will serve to determine their relative value. For absolute precision and from a mathematical point of view the method of Mett must be considered a better one.

Pawlow says that the lumen of the tubes should be 1-2 mm. I have tested tubes of 4 different sizes and thought at first that capillary tubes with very fine canals would show a finer graduation. This was not so. The



following figures will show that tubes below 1 mm. indicate rather low numbers. The reason for this seems to be the difficulty of the outflow of the digested albumin. The area of a circle varies as the square of the radii: $a : a = r^2 : r^2$; therefore, $0.4 : 1.0 : 1.5 : 2.0 = 4 : 25 : 55 : 100$.

A glass tube with 1 mm. lumen therefore has a capacity for outflow more than 6 times greater than a tube with 0.4 mm. diameter. On the other hand, a tube with 1.5 mm. lumen has only double the outflowing capacity of a tube with a 1 mm. lumen.

0.4 mm. lumen.	1 mm. lumen.
1st case 1.8 to 1.6	2.1 to 2.2
2d " trace	0.4
3d " 0	0.2

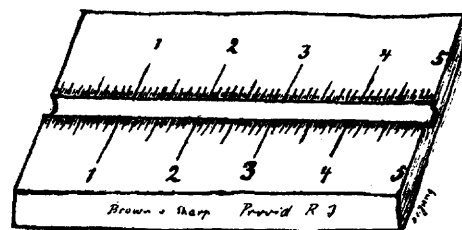
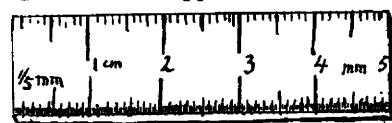
Then I tested tubes with apertures of 1 and 1.5 mm. The result showed that both worked practically alike:

1 mm.	1.5 mm.
1st.... $1.6 + 1.8 = 3.4$	2 + 1.4 = 3.4
2d.... $0 + 0 = 0$	0 + 0 = 0
3d.... $1.8 + 1.8 = 3.6$	1.6 + 1.6 = 3.2
4th.... $0.8 + 0.8 = 1.6$	0.8 + 1.2 = 2.0
5th.... $3 + 2.6 = 5.6$	2.6 + 2.8 = 5.4
6th.... $2 + 2 = 4$	2 + 2 = 4

These six random cases show that 1 mm. tubes give practically the same results as 1.5 mm. tubes. There was noticed, however, a difference in albumin only two days old and albumin one week old:

1.5 mm. 2 days old.	1.5 mm. 7 days old.
$2 + 2 = 4$	$3 + 3 = 6$
$1 + 0.8 = 1.8$	$1.4 + 1.2 = 2.6$

Dr. Schorlemmer of Berlin has constructed a suitable apparatus and allowed me very courteously to have it duplicated by Hermann Rohrbeck in Berlin, which kindness is hereby gratefully acknowledged. The advantages of this instrument are that one can both measure and cut with it. On the left is a knife with a scale underneath, enabling one to cut off pieces of exactly 3 mm., which after digestion has taken place can be measured on a graduated glass scale. The tubes are kept in place by a spring. In order to distinguish 0.5 mm. a lens of 2 or 3 times magnifying power is applied. I found it difficult to get always the best light on the scale, which also seems to be too short, being only 3 mm. in length. If it happens that a tube is a few



fifths of a millimeter longer than the ruler, the measuring on one side will not be correct unless one reverses the ends. Since the knife has always a slight inclination to oscillate it does not always cut off exactly a piece 3 mm. in length. In order to overcome this difficulty, I resorted to a simpler arrangement where the graduation is not made upon a glass slide, but upon steel, which is indestructible and can be cleaned. Furthermore, it is 5 cm. long, divided into 0.2 mm. and the scale is plainly visible by simply placing the tube into a rounded depression made for this purpose and reading the markings of both ends through a magnifying glass. I even use a simple steel ruler with 0.2 mm. graduation which I place on a black background and put the tube alongside of it. These instruments were made to my satisfaction by the firm of Messrs. Brown & Sharp Manfg. Co., Providence, R. I.

As soon as a glass tube filled with coagulated albumin has been opened, the atmospheric influences begin to work and destroy the solidity of the albumin column. It is necessary to use an egg albumin of equal consistency for filling the tubes. It ought to be either the more liquid part or the more solid part, care being taken

not to mix both in the same tube. The tubes should not be opened before they are 3 days old. They should be kept well closed at both ends either with cotton or rubber caps. Just before use, a tube is cut into suitable pieces, care being taken to use only tubes free from air bubbles. I prefer after all experiments a tube with a lumen of 1.5 mm., which shows, as we have seen, the same measurement of the digested parts and has the advantage over the 1 mm. tube of being more easily read. The larger tubes show sharper markings, because the digested portion of the albumin column can flow out more readily. This difficulty was well marked with 0.4 mm. tubes; if the edges are not sharp the albumin column has not been of equal consistency. The best tubes show 3 zones: 1, albumin, sharply cut; 2, a fine hazy cloud; 3, clear glass; or 2 zones: 1, albumin, sharply cut; 2, clear glass.

Two tubes are always placed into 0.5 c.c. gastric juice and the average digestion of both is taken as the result. A ruler of the finest graduation of fifths of millimeters being employed, the accuracy of measurement to millimeters and even half millimeters is guaranteed.

Case No.	Diagnosis.	Mettien. c.c.	Total acid	Free HCl	HCl left.	Mett. Diameter.		Hammer- schlag.	Rennet. Zymogen.
						1 mm.	1.5 mm.		
1	Enteroptosis.	60	24	..	..	..	3.8	..	..
2	Gastroptosis, eructatio nervosa.	56	24	..	..	..	2.2	..	..
3	Catarrh ventri, chronic.	58	14	..	..	..	..	57	pos 1:160
4	Catarrh chronicus, atonia	240	16	0	..	..	..	17	..
5	Cat. chronic, insuff., mitral, atonia.	200	22	0.32	..	..	0.1	25	pos. 1:80
6	Epilepsy, atonia, pyloro- spasmus(?)	292	48	22	..	..	9.5	46	..
7	Enteroptosis, catarrh chronicus.	34	0	18	..	..	0.5	20	..
8	Atonia, catarrh. chronicus	230	30	8	..	..	0.25	16	..
9	Enteroptosis, superacidity	96	58	..	..	..	10	70	..
10	Enteroptosis, colitis chron. ica, ovaries removed	86	34	..	..	..	4.7	..	..
11	Superacid. nervosa.	96	66	..	..	..	5.6	..	..
12	Enteroptosis.	82	22	..	..	..	2.8	..	..
13	Catarrh chronicus.	48	12	..	..	..	1.5	50	..
14	Colitis membran., subacid. nervosa.	48	12	..	..	..	0.7	50	pos 1:160
15	Ectasia.	274	44	8	..	..	0.8	..	..
16	Catarrh ventri.	14	0	54	..	..	0.1	..	..
17	Superaciditas nervosa.	74	32	..	..	4	6.	..	..
18	Enteroptosis, constipatio chronica	52	26	..	..	2.4	3.4	..	..
19	Catarrh chronicus, vomitus matutinus.	35	15	..	..	3.4	3.4	..	..
20	Subacid. nervosa, enterop- tosis	42	6	..	..	3.6	3.8	33	..
21	Dyspepsia nervosa.	78	30	..	..	..	..	47	..
22	Dyspepsia nervosa, super- acidity	74	60	..	..	..	..	80	..
23	Superacidity.	84	52	..	..	11.	..	43	..
24	Achylia gastrica	16	..	58	0.2	0.2	..	17	..
25	Gastrostocorrhea super- acid.	340	54	42	..	10.8	..	67	..
26	Atony.	191	70	38	..	10.	..	..	..
27	Tuberculosis pulm., catarrh ventri.	40	10	..	..	1.5	..	..	..
28	Catarrh ventri chronic.	62	8	..	..	0.4	..	..	..
29	Atonia, subacidity.	291	46	16	..	..	..	50	..
30	Diarrhea nervosa.	110	32	..	..	6.	..	60	..
31	Chlorosis atonia	191	70	30	..	3.6	..	..	..
32	Catarrh ventri, chronic.	70	50	1.6	2.	..	..	75	pos. 1:160
33	Superacid. nervosa.	92	64	5.6	5.4	..	..	59	..
34	Atonia, superacid.	182	94	3.6	3.5	..	..	..	..
35	Superacid. nervosa.	72	30	..	1.0	..	..	..	..
36	Superacid. nervosa.	100	66	..	5.	..	..	67	..
37	Gastroptosis, anemia	82	32	..	2.3	..	..	..	..
38	Atonia, superacid.	180	84	44	..	3.1	..	..	..
39	Colitis chronica	71	42	..	5.2	..	..	..	..
40	Atonia, superacid.	230	82	46	..	4.2	..	..	..

I.

SUPERACIDITY CASES; METT'S METHOD.

Case No.	Total Acidity.	Free HCl.	Mm.
9	96	58	10
10	86	34	4.7
11	96	66	5.6
12	82	22	2.8
17	74	32	6.0
23	84	52	11.0
25	54	42	10.8
26	70	38	10
30	110	32	6

Case No.	Total Acidity.	Free HCl.	Mm.
31	70	30	3.6
33	92	64	5.4
34	94	56	3.5
35	72	30	1.0
36	100	66	5
37	82	32	2.3
38	84	44	3.1
39	74	42	5.2
40	82	46	4.2

18 cases.

11 to 1 mm.,
average 5.5.

II.

CASES OF SUB- AND AN-ACIDITY; METT'S METHOD.

Case No.	Total Acidity.	Free HCl.	H.A. Def.	Mm.
5	22	..	32	0.1
7	34	..	18	0.5
8	30	8	..	0.25
13	48	12	..	1.5
14	48	12	..	0.7
15	44	8	..	0.8
16	14	..	54	0.1
19	35	15	..	3.4
20	42	6	..	3.8
24	16	..	58	0.2
27	40	10	..	1.5
28	62	8	..	0.4
32	70	..	50	2.0

13 cases.

0.1 to 3.8 mm.,
average 1.9.

III.

METT'S METHOD; NORMAL ANALYSIS.

Case No.	Total Acidity.	Free HCl.	Mm.
1	60	24	3.8
2	56	24	2.2
6	48	22	9.5
18	52	26	3.4

4 cases.

9.5 to 2.2 mm.,
average 5.9.

IV.

SUPERACIDITY CASES;

HAMMERSCHLAG'S METHOD.

SUB- AND AN-ACIDITY.

Case No.	Hammerschlag.	Case No.	Hammerschlag.
9	70	3	57
21	47	4	17
22	80	5	25
23	43	7	20
25	67	8	16
30	60	13	50
33	59	14	50
..	..	24	17
..	..	29	50
..	..	32	75

7 cases.

80 to 43 mm.,
average 60.

10 cases

75 to 16 mm.,
average 45.

VI.

HAMMERSCHLAG'S METHOD, NORMAL CASE.

Cases No.	Total Acidity.	Free HCl.	Hammerschlag.
6	48	22	46

VII.

Case No.	Mm.	Hammer- schlag.	Diagnosis.	Total Acid.	Free HCl HCl Deficit.
23	11	43	Superacidity.	84	52
25	10.8	67	Superacidity.	54	42
6	9.5	46	Atonia nervosa.	48	22
9	10	70	Superaciditas.	96	58
30	6	60	Superaciditas nervosa.	70	30
33	5.4	59	Superaciditas nervosa.	92	64
36	5	67	Superaciditas nervosa.	100	68
20	3.8	33	Subaciditas nervosa.	42	6
32	2	75	Catarrh. chronicus.	70	0
13	1.5	50	Catarrh. chronicus.	48	12
14	0.7	50	Subaciditas nervosa.	48	12
7	0.5	20	Catarrh. chronicus.	34	0
8	0.25	16	Catarrh. chronicus.	30	8
24	0.2	17	Achylia gastrica.	16	0
5	0.1	25	Catarrh. chronicus.	22	0

15 cases.

VIII.				
Case. No.	Hammerschlag.	Mm.	Free HCl.	HCl deficit.
32	75	2	..	50
9	70	10	58	..
25	67	10.8	42	..
36	67	5	66	..
30	60	6	32	..
33	59	5.4	64	..
13	50	1.5	12	..
14	50	0.7	12	..
6	46	9.5	22	..
23	43	11	52	..
20	33	3.8	6	..
5	25	0.1	..	32
7	20	0.5	..	18
24	17	0.2	..	58
8	16	0.25	8	..

15 cases.

From the above list, the following conclusions are drawn:

1. The normal values for the pepsin digestion are, according to Mett's method, 5.5 to 5.9 mm. (List I and III.)

2. With Mett's method, sub- and an-acidity have lower values than normal or superacidity (1.9 mm. is the average). They do not reach the average values of superacidity.

3. The diminution of pepsinogen does not run proportional with that of HCl. Even with a deficiency of HCl, the value of pepsin can be higher than that of mild subacidity. (List II.)

4. Superacidity, generally speaking, has high and highest values of pepsin, yet there are cases of unusually high HCl figures with disproportionately low pepsin values. This points distinctly to a pepsin question. Large quantities of HCl after a Boas test breakfast do not always include a free secretion of pepsin.

5. According to the method of Hammerschlag, 60 seems to be the normal figure of pepsin secretion. (List IV.)

6. With Hammerschlag's method in opposition to Mett, the values of sub- and an-acidity reach the average of that of superacidity. The average values approach each other more with Hammerschlag's method.

5.5 Superacidity: 1.9 Subacidity Mett.

60 Superacidity: 45 Subacidity Hammerschlag.

7. Besides, with Hammerschlag, we see no proportion of the HCl diminution and the pepsin secretion in cases of subacidity. (List V.)

8. The methods of Hammerschlag and Mett show the same proportions in 66 per cent. of the cases. (Lists VII and VIII.)

9. In five cases out of 15 the two methods give different results. In Cases 6 and 23 it is question of normal and superacidity. Hammerschlag's figures do not correspond to the high millimeter readings but only show medium values. On the other hand, Cases 32, 13 and 14 have proportionately high Hammerschlag figures with low millimeter values. The corresponding HCl values are subnormal. In other words, in all those cases in which Mett's method differs from Hammerschlag's, the former seems to approach closer to the values of HCl. Generally speaking, this may be considered as an advantage of Mett's method.

10. It will be necessary in future to examine not only sub- and an-acid juices for their digestive strength, but also superacid juices which heretofore were considered as having *eo ipso* good digestive capacity.

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At the recent meeting in Washington of the Committee on National Legislation representing the American Medical Association, the subject of reciprocity between the several states was very generally discussed, and considered practically impossible with so many states and territories, each with its own standard and no two alike. More than half of the states were represented at the conference and the interchange of opinion was free. The committee appointed one year ago made a majority report through its secretary, Dr. Emil Amberg, advising against reciprocity, and in favor of a National Board of Examiners. The committee had, however, been working upon the hypothesis that such a board could be created and sustained by act of Congress. Letters read from Senator Burrows and others caused the committee to drop the idea of a national board created by act of Congress as such legislation would certainly be unconstitutional and in conflict with the several states. The states are sovereign and can not be coerced by the general government.

There is, however, nothing to prevent, or seriously in the way of a Voluntary National Board of Examiners, whose examinations shall be of such a character and high standard as to command the respect of the several states and cause them to issue license to any one who has successfully passed such an examination. To fail to do so, as was said by Professor William Welch in the discussion, would make such state ridiculous. I therefore offered this amendment to the report of the committee, which was promptly accepted and unanimously approved after full discussion. I then suggested that this board consist of six members, viz., the Surgeons-General of the Army, Navy and Marine-Hospital Service and three equally representative civil practitioners; two to be elected by the House of Delegates of the American Medical Association and one by the American Congress of Physicians and Surgeons. A seventh might be added to represent the National Board of Examiners. This board would at once have the confidence of the profession as it would be comprised of able men absolutely above suspicion. The time of