

## **ZB MED - Informationszentrum Lebenswissenschaften**

### **The skin reactions, blood chemistry and physical status of 'normal' men and of clinical patients**

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VII. SENSITIZED PERSONS AND PERSONS WITH DISEASES OF THE SKIN

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## VII. SENSITIZED PERSONS AND PERSONS WITH DISEASES OF THE SKIN

### ANGIONEUROTIC EDEMA

CASE 152.—A white man, American, aged 27, had a swelling of the scrotum two years prior to the examination. The swelling lasted one day and returned at intervals of from three to four months for one year. During a remission, the patient received tetanus antitoxin. Four days later, his throat and tongue were involved. Two months later, the same kind of attack occurred. The last attack had lasted six days and was disappearing at the time of the examination.

The father had had angioneurotic edema for ten years. The mother once had urticaria. Two aunts had epilepsy. The patient had suffered at various times from attacks of migraine and was sensitive to strawberries.

This patient, it is to be noted, had a short blister time, with increased capillary permeability, a distinctly vagotonic reaction to epinephrine and diminished flares of the reactions to epinephrine and morphine with increased flares of the reactions to thyroxin and caffeine.

CASE 38.—A young Jewish druggist, aged 35, with a history of angioneurotic edema, had three sisters, one of whom had epilepsy, one of whom was nervous and one of whom was seemingly well. The father was 70 years of age and well. The mother was 65 years of age and suffered from neurasthenia. This patient formerly had a typical Sunday migraine. At the time of examination, he had pruritis, and was sensitive to raspberries. Formerly, ingestion of milk caused cramps and diarrhea. Watermelon still had this effect. At the time of examination, he was without angioneurotic manifestation.

As in the previous case, we find the patient in this case showing a short blister time with somewhat increased capillary permeability, but no chemical changes. The systolic reaction to epinephrine was vagotonic, but the pulse pressure showed an increase immediately after the injection. The capillaries of the skin appeared swollen and were markedly red, and in some a distinct granulation became apparent. The flares of the intracutaneous reactions (except of that to epinephrine) were all increased.

### URTICARIA

CASE 171.—Menstrual Urticaria: A young woman, Jewish, aged 23, a laboratory worker, was alert, nervous and rather irritable. Her family history was negative except in relation to tuberculosis. The grandfather had had tuberculosis, and the mother died of tuberculosis. The patient had malaria in 1921. At the time of the examination, she had slight mitral insufficiency. She had had a rather irregular menstrual course. The urticaria, which was generalized, began one or two days before the menstrual period, and lasted approximately a week. The patient was then free from urticaria during the intermenstrual period. The patient recently had had a curettage and since then had been free from disturbance.

The comparison of the observations during the menstrual period with the intermenstrual observations is of interest. During the menstrual period, the permeability of the capillaries was increased, the potassium level, as well as the

K/Ca ratio, was lowered, there was less cholesterol and the systolic blood pressure and the pulse rate were higher. The reaction to epinephrine was sympatheticotonic during both periods, more so during the intermenstrual time, when, too, the intracutaneous reaction to epinephrine was more marked. The wheals of the reactions to thyroxin and caffein were larger than normal at both times.

CASE 116.—A young Irish woman, aged 30, came to America four years prior to the examination. The first attack of urticaria appeared two years before the examination, when she had angioneurotic edema. Two months before, her father died of pernicious anemia and the attack in question dated from this time. The urticaria was worse at night and because of the interference with sleep the patient was rather nervous. The family history was negative. On general physical examination, the spleen was found enlarged, the icteric index was increased and bile was also present in the urine. With minor exceptions, the urticaria had persisted to the time of examination. No definite sensitization could be determined, but the skin was particularly sensitive to staphylococci. The function of the reticulo-endothelial system, as determined by administration of a vegetable oil (oleokinol), seemed practically normal.

The results of the examination were as follows: A strikingly short blister time, low permeability of the capillaries and a distinctly vagotonic reaction to epinephrine with the pulse pressure much increased. The results of all the chemical examinations were within the normal limits.

CASE 139.—A stenographer, American, aged 29, had vitiligo for ten years and urticaria for some eight weeks. She had jaundice at the age of 11, for two weeks. Of late, she had been nervous, with occasional palpitation. She had a nervous breakdown at the age of 19. She felt "shaky" when she worked hard, but had suffered no loss of weight. One other sister had vitiligo and one had diabetes. The urticaria was made worse by pineapple, popcorn and watermelon.

Practically the only abnormalities were that found in the pulse rate and the vagotonic reaction to epinephrine. There was a trace of albumin in the urine. The intracutaneous reactions to epinephrine and morphine showed lessened wheals and those to thyroxin and caffein increased wheals and flares. The patient was treated with calcium for two months. On reexamination, the blister time was somewhat shortened, the permeability of the capillaries was increased and the calcium was lower. During this time, however, the patient was somewhat improved.

#### ECZEMA

CASE 101.—A laborer, aged 55, born in Scotland, one of our group of 100 normal men, had chronic eczema of the legs. He had a history of moderate alcoholism. The family history was negative, except that one uncle had epilepsy. The patient was rather stolid and seemingly unemotional. Fifteen years prior to the examination, he had had rather severe diarrhea and with it urticaria.

The examination of this patient revealed merely a low capillary permeability together with a diminished intracutaneous reactivity to morphine. The reaction to epinephrine was sympatheticotonic.

CASE 132.—The clinical history of the patient, the most interesting of the entire group of patients, has been described. It is to be recalled that he had the lowest K/Ca ratio of all the patients, the lowest CO<sub>2</sub> combining power and

increased muscle reactivity. The cholesterol level was high, the Kromayer light erythema faint, the pulse rate slow and the reaction to epinephrine vagotonic. The wheals of the reactions to thyroxin and caffeine were somewhat increased.

The results of the examination of this patient emphasize the impossibility of schematizing the results and the futility of endeavoring to place these persons in hard and fast groups. The patient was typically vagotonic, but, in addition, he was suffering from a relative acidosis. Despite this acidosis, the muscular irritability was high.

#### GASTRO-INTESTINAL SENSITIZATION

CASE 54.—A man, American, aged 49, showed a trace of albumin in the urine and x-ray evidence of myocarditis and sclerosis. He was sensitive to peaches and strawberries (urticaria). The reaction to epinephrine (systolic) was distinctly vagotonic, but the pulse rate was sympatheticotonic.

CASE 172.—A Greek, aged 30, who had had a positive Wassermann reaction in 1921, had Raynaud's disease. The family history was negative. The calcium level was high (low K/Ca ratio), the reactions to the Kromayer light and ice were faint, the blood pressure was low and the reaction to epinephrine was markedly sympatheticotonic. All intracutaneous reactions to the pharmacologic substances injected were marked. The patient was sensitive to peaches and cherries.

CASE 169.—The patient had Buerger's disease (Wassermann reaction ++++). He showed a high calcium level with a low K/Ca ratio. The serum proteins were concentrated, the reaction to Kromayer light was faint and the reaction to epinephrine (systolic) was vagotonic. The flares of all the intracutaneous reactions (except that to epinephrine) were absent. The patient was sensitive to strawberries.

CASE 14.—A German, aged 36, an artisan, had albumin and casts in the urine, together with an undetermined reducing substance (not dextrose). He probably had gallbladder disease. He was sensitive to honey and pineapple; these caused intense pain. The capillaries of the skin were increased in number, and their permeability was high. The calcium level was high and the K/Ca ratio was low. The cholesterol level was also high and the reactions to the Kromayer light and ice were faint. The reaction to epinephrine was vagotonic. The wheal of the reaction to epinephrine was increased and the flare diminished.

#### PURPURA

CASE 120.—A Hungarian woman, who gave a history of sensitiveness to tomatoes, on admission had petechial hemorrhages over the body and the extremities, showers appearing at intervals of from twenty-four to forty-eight hours. There was considerable blood in the urine. It may be noticed that the permeability of the capillaries was high and the endothelial reaction (Rumpel-Leede) was positive. The blood chemistry was normal, except for an increase in the globulins. Microscopic examination revealed distinct granulations of the skin capillaries.

#### PREVIOUS SENSITIZATION—HAY-FEVER

CASE 128.—An American workman, of Irish parentage, aged 66, stated that he had had hay-fever for years. In addition, he had an enlarged prostate and

x-ray evidence of arteriosclerosis of the larger vessels. The capillaries of the skin showed distinct granulations and the urine contained albumin. The blood chemistry was practically normal.

CASE 148.—A white woman, aged 67, had glaucoma and vitiligo. She had had hay-fever twenty-five years prior to the examination and had had urticaria. X-ray examination of the chest showed considerable healed pulmonary tuberculosis and arteriosclerosis, and she gave a history of having had cerebral hemorrhages. The capillaries of the skin showed granulations; the reaction to epinephrine was vagotonic.

CASE 140.—A white man, aged 45, suffering from alcoholism and glaucoma, had a history of hay-fever every spring. There was roentgenologic evidence of active tuberculosis. Examination of the capillaries of the skin showed dilatations, but the total number was diminished. There was a trace of albumin in the urine and the reaction to epinephrine was vagotonic.

CASE 93.—An American workman, aged 53, a periodic drinker, had a history of hay-fever every fall (ragweed). In addition, he was sensitive to halibut. He was short of breath and the x-ray picture indicated a myocarditis. The reaction to epinephrine was vagotonic; the capillaries appeared to be normal.

CASE 160.—A white man, American, aged 58, was suffering from glaucoma. He gave a history of asthma extending over many years. An x-ray picture of the chest indicated emphysema and bronchiectasis, together with arteriosclerosis of the larger vessels. The reaction to epinephrine was vagotonic. The capillaries appeared to be unchanged.

CASE 36.—A white man, American, aged 43, had an attack of hay-fever four or five years prior to the examination. The reaction to epinephrine was vagotonic, and there was a trace of albumin in the urine.

All the members of this group showed relatively high K/Ca ratios, CO<sub>2</sub> combining power within normal limits and faint reactions to the Kromayer light. Their blood pressures were relatively low and their pulse rates were somewhat increased.

#### PREVIOUS SENSITIZATION—URTICARIA AND ANGIONEUROTIC EDEMA

CASE 45.—An American workman, aged 39, had a history of scarlet fever with involvement of the kidneys at the age of 4. The blood pressure was 162 systolic and 114 diastolic. The reaction to epinephrine was vagotonic. The patient had had urticaria twenty years before.

CASE 86.—A former dentist, aged 50, was extremely nervous, with a history of alcoholism. He had had angioneurotic edema twenty-five years before. The reaction to epinephrine was vagotonic.

CASE 56.—An American workman, aged 44, had x-ray evidence of active pulmonary tuberculosis. He had had angioneurotic edema and dermatographia three years before. The reaction to epinephrine was vagotonic.

CASE 77.—An American workman, aged 39, formerly suffered from alcoholism. His grandfather had asthma. He stated that he had sugar in the urine and that ten years ago he had urticaria from eating sweet potatoes. The patient was

nervous. He gave a vagotonic reaction to epinephrine and a positive endothelial reaction (Rumpel-Leede).

CASE 80.—An American workman, aged 29, was nervous and had a distinct tremor. He had had urticaria three years before. He gave a distinct vagotonic reaction to epinephrine.

*The Results of Correlative*

| Patient | Diagnosis                        | Blister Time, Hours | Capillary Permeability, % | Inflammatory Index | Calcium, Mg. | Potassium, Mg. | K / Ca Ratio | Sugar, Mg. | Protein, Mg. | Globulin, Mg. | CO <sub>2</sub> Combining Power | Cholesterol, Mg. | Kromayer Light Erythema Time, Min. | Skin Resistance | Ice Reaction | Basal Metabolic Rate | Blood Pressure |           |            | Reaction to Epinephrine |                    | Weight/Length Ratio |
|---------|----------------------------------|---------------------|---------------------------|--------------------|--------------|----------------|--------------|------------|--------------|---------------|---------------------------------|------------------|------------------------------------|-----------------|--------------|----------------------|----------------|-----------|------------|-------------------------|--------------------|---------------------|
|         |                                  |                     |                           |                    |              |                |              |            |              |               |                                 |                  |                                    |                 |              |                      | Systolic       | Diastolic | Pulse Rate | Pulse Pressure, %       | Systolic           |                     |
| 152     | Angioneurotic edema              | 4                   | 73                        | 18                 | 9.8          | 20.1           | 2.05         | 63         | 7.47         | 20            | 63.4                            | 175              | 60                                 | 0.18            | 15           | 4.8                  | 120            | 74        | 80         | -5                      | Vagotonic          | 243                 |
| 38      | Angioneurotic edema              | 5                   | 69                        | 14                 | 9.8          | 21             | 2.14         | 86         | 8.28         | 40            | 58.5                            | ...              | 90                                 | 0.29            | 10           | 11.5                 | 124            | 65        | 84         | +31                     | Vagotonic          | 194                 |
| 171     | Menstrual urticaria              | 5                   | 73                        | 14                 | 12.6         | 17.9           | 1.42         | 72         | ...          | ...           | 48.7                            | 202              | 75                                 | 0.08            | 20           | 8                    | 114            | 66        | 96         | +18                     | Sympathetico-tonic | 160                 |
|         | (Intermenstrual observations)    | 6                   | 64                        | 10                 | 12.6         | 21.3           | 1.68         | 64         | 7.41         | ...           | 46                              | 230              | ...                                | 0.08            | ...          | 12                   | 102            | 68        | 68         | +100                    | Sympathetico-tonic | 160                 |
| 116     | Urticaria                        | 3½                  | 60                        | 17                 | 10           | 19.4           | 1.94         | 78         | 6.98         | 40            | 55.1                            | 175              | 30                                 | 0.60            | 20           | 9                    | 128            | 50        | 80         | -17                     | Vagotonic          | 195                 |
| 139     | Urticaria and vitiligo           | 6                   | 65                        | 11                 | 9.7          | 18.4           | 1.9          | 81         | 7.10         | 18            | 50                              | 175              | 120                                | 0.20            | 8            | 5                    | 113            | 71        | 104        | +12                     | Vagotonic          | 176                 |
| 101*    | Eczema                           | 4½<br>8¼            | 68.5<br>47                | 15<br>5.4          | 8.6<br>9.4   | 18.7<br>19.4   | 2.1<br>2.06  | 78<br>65   | 7.95<br>7.20 | ...           | 50<br>57.4                      | 190<br>158       | 90                                 | 0.13            | 15           | 31                   | 132            | 76        | 67         | +13                     | Sympathetico-tonic | 191                 |
| 132     | Eczema                           | 6                   | 68                        | 11.3               | 13.4         | 15             | 1.12         | 67         | 7.30         | 23            | 40.3                            | 256              | 120                                | 0.31            | 10           | -1.2                 | 132            | 78        | 56         | 0                       | Vagotonic          | 234                 |
| 54*     | Sensitized                       | 6                   | 60                        | 10                 | ...          | 22             | ...          | 80         | 8.28         | 33            | 56.6                            | ...              | 75                                 | 0.26            | 25           | -3.4                 | 108            | 68        | 72         | +90                     | Vagotonic          | 256                 |
| 172     | Sensitized                       | 12                  | 72                        | 6                  | 13           | 21.3           | 1.64         | 76         | 8.16         | ...           | ...                             | ...              | 105                                | 0.08            | 45           | -18                  | 108            | 78        | 94         | +90                     | Sympathetico-tonic | 166                 |
| 169     | Sensitized                       | 15                  | 62                        | 4.1                | 12.3         | 19.24          | 1.56         | 67         | 9.87         | 20            | 55.1                            | 158              | 120                                | 0.23            | 25           | -7                   | 118            | 78        | 82         | +40                     | Vagotonic          | ...                 |
| 14*     | Sensitized                       | 7                   | 74                        | 10.5               | 11.2         | 19.6           | 1.75         | 67         | 8.06         | 37            | 65                              | 278              | 95                                 | 0.20            | 40           | 2.7                  | 128            | 80        | 76         | 0                       | Vagotonic          | 198                 |
| 120     | Purpura                          | 6                   | 82                        | 13                 | 10           | 19.9           | 1.99         | 71         | 7.95         | 50            | 52.2                            | 185              | 70                                 | ...             | 14           | -5                   | ...            | ...       | ...        | ...                     | ...                | 172                 |
| 128*    | Hay-fever for years              | 15                  | 68                        | 3.8                | 10.2         | 19.7           | 1.93         | 79         | 8.06         | 55            | 58.1                            | 230              | 240                                | 1               | 24           | -18                  | 122            | 70        | 84         | +24                     | Vagotonic          | 180                 |
| 148     | Glaucoma                         | 15                  | 56                        | 3.7                | 9.7          | 24.3           | 2.5          | 79         | 7.97         | 24            | 69.5                            | 317              | 85                                 | 0.26            | 10           | +17                  | 114            | 72        | 94         | +18                     | Vagotonic          | 182                 |
| 140     | Glaucoma                         | 15                  | 68                        | 4.05               | 11.4         | 29.7           | 2.61         | 82         | 6.25         | 37.5          | 55.6                            | 158              | 150                                | 0.45            | 40           | ...                  | 100            | 70        | 70         | +10                     | Vagotonic          | ...                 |
| 93*     | .....                            | 6                   | 50                        | 8.3                | 7.6          | 24.5           | 3.22         | 70         | 8.59         | 42            | 57                              | 230              | 90                                 | 0.25            | 12           | 0                    | 113            | 71        | 86         | +19                     | Vagotonic          | 267                 |
| 160     | Glaucoma                         | 15                  | 66                        | 4.4                | 10.86        | 21.58          | 1.98         | 65         | 8.16         | 44            | 62.7                            | 190              | 70                                 | 0.4             | 10           | +16                  | 128            | 64        | 68         | -28                     | Vagotonic          | 190                 |
| 36*     | Cardiovascular renal disease     | 8                   | 58                        | 7.2                | 12.1         | 26.3           | 2.17         | 90         | 8.28         | 33            | 57.6                            | ...              | 120                                | 0.11            | 20           | +1.3                 | 104            | 50        | 84         | +28                     | Vagotonic          | 227                 |
| 45*     | Cardiovascular renal disease     | 6                   | 54                        | 9                  | 11.2         | 16.6           | 1.48         | 77         | 7.73         | 40            | 54.3                            | ...              | 45                                 | 0.28            | 20           | +20                  | 162            | 114       | 84         | +8                      | Vagotonic          | 317                 |
| 86*     | Nervous                          | 15                  | 58                        | 3.8                | 12.6         | 15.9           | 1.26         | 94         | 6.33         | 40            | 55                              | 185              | 105                                | 0.36            | 25           | +6.4                 | 118            | 60        | 74         | -14                     | Vagotonic          | 176                 |
| 56*     | (Roentgen evidence) tuberculosis | 6                   | 61                        | 10                 | 9.8          | 28.6           | 2.52         | 65         | 9.36         | 35            | 56.6                            | ...              | 135                                | 0.32            | 15           | -17.9                | 124            | 88        | 80         | +22                     | Vagotonic          | 247                 |
| 77*     | Nervous                          | 9                   | 87                        | 10                 | 10.8         | 15.6           | 1.44         | 71         | 6.98         | 36            | 60.6                            | 196              | 240                                | 1               | 35           | +7.9                 | 126            | 78        | 82         | +7                      | Vagotonic          | 187                 |
| 80*     | Nervous                          | 6                   | 91                        | 15.1               | 8            | 13.7           | 1.7          | 69         | 8.28         | 33            | 53.2                            | 222              | 100                                | 1.6             | 30           | +13                  | 116            | 68        | 64         | +12                     | Vagotonic          | 212                 |

\* The patient belonged to the group of 100 so-called "normal" men.

COMMENT

When considering the results of the examination of the group of persons who were presumably sensitized, it must be kept in mind that one can hardly expect distinct chemical alterations in conditions in which the clinical manifestations were so frequently evanescent and transitory,

Nathan and Stern<sup>1</sup> rightly emphasized that a single determination of the K/Ca ratio—for instance, during the course of a dermatosis—hardly gives a true picture, typical for the disease. One must make repeated determinations in order to obtain a true insight into the fluctua-

*Examinations of Sensitized Persons*

| Changes in Capillaries    | Arteriosclerosis,<br>X-Ray | Healed Tuberculosis | Active Tuberculosis | Changes in Urine     | Intracutaneous Reactions |            |            |            |            |            |            |            | Endothelial Reaction | Age | Sex | Associated Conditions and History                                                                |
|---------------------------|----------------------------|---------------------|---------------------|----------------------|--------------------------|------------|------------|------------|------------|------------|------------|------------|----------------------|-----|-----|--------------------------------------------------------------------------------------------------|
|                           |                            |                     |                     |                      | Epinephrine              |            | Morphine   |            | Thyroxin   |            | Caffein    |            |                      |     |     |                                                                                                  |
|                           |                            |                     |                     |                      | Wheal, Mm.               | Flare, Mm. | Wheal, Mm. | Flare, Mm. | Wheal, Mm. | Flare, Mm. | Wheal, Mm. | Flare, Mm. |                      |     |     |                                                                                                  |
| .....                     | ..                         | ..                  | ..                  | Hyaline casts        | 26                       | 7.5        | 9.5        | 10         | 9          | 8          | 9          | 10         | ..                   | 27  | M   |                                                                                                  |
| Dilatations, granulations | ..                         | ..                  | ..                  | .....                | 18                       | 8.6        | 8.8        | 25.4       | 10.2       | 10.4       | 4.8        | 11.6       | ..                   | 39  | M   |                                                                                                  |
| Dilatations               | ..                         | +                   | ..                  | Albumin, faint trace | 17.5                     | 10.5       | 12.5       | 0          | 18         | 0          | 20         | 0          | ..                   | 23  | F   |                                                                                                  |
| Dilatations               | ..                         | +                   | ..                  | .....                | 26                       | 6.5        | 10         | 12.2       | 20         | 0          | 17         | 8          | ..                   | 23  | F   |                                                                                                  |
| .....                     | ..                         | ..                  | ..                  | Bile                 | 20.4                     | 7.4        | 9.2        | 8          | 5          | 0          | 18.2       | 0          | ..                   | 30  | F   |                                                                                                  |
| Dilatations               | ..                         | ..                  | ..                  | Albumin, faint trace | 16                       | 11         | 9.5        | 7.5        | 14         | 12.5       | 14         | 12         | ..                   | 29  | F   |                                                                                                  |
| Dilatations               | ..                         | +                   | ..                  | .....                | 19.6                     | 7          | 10.2       | 6          | 10         | 0          | 18.4       | 0          | +                    | 55  | M   |                                                                                                  |
| Dilatations               | ..                         | +                   | ..                  | .....                | 18.4                     | 9.4        | 14.6       | 17.6       | 13.4       | 5          | 22.6       | 6          | ..                   | 26  | M   |                                                                                                  |
| .....                     | ..                         | ..                  | ..                  | Albumin, trace       | 21.2                     | 10.4       | 11         | 18         | 12         | 0          | 11         | 0          | ..                   | 49  | M   | Sensitization to peaches and strawberries; cirrhosis probable                                    |
| Dilatations               | ..                         | +                   | ..                  | .....                | 22.4                     | 16         | 15.5       | 8.5        | 18         | 16         | 20         | 7.5        | ..                   | 30  | M   | Raynaud's disease; syphilis, 1921; sensitization to peaches and cherries                         |
| Retina pale               | ..                         | +                   | ..                  | .....                | 20.8                     | 11         | 13         | 0          | 18         | 0          | 21         | 0          | ..                   | 27  | M   | Buerger's disease; syphilis (Wassermann +); sensitization to strawberries                        |
| .....                     | ..                         | ..                  | ..                  | Casts                | 24.4                     | 6.2        | 13.2       | 7.2        | 15         | 5          | 9.8        | 10         | ..                   | 36  | M   | Probably gallbladder disease; intense pain caused by honey and pineapple                         |
| Granulations              | ..                         | ..                  | ..                  | Blood                | 21.2                     | 7.2        | 9.6        | 8.2        | 12.1       | 0          | 13         | 0          | +                    | 18  | F   | Purpura hemorrhagica; sensitization to tomatoes                                                  |
| Granulations              | +                          | +                   | ..                  | Albumin              | ....                     | ....       | 12.6       | 10.2       | 14.4       | 0          | 22.6       | 0          | -                    | 66  | M   | Hay-fever for years                                                                              |
| Granulations              | +                          | ..                  | ..                  | .....                | 18                       | 12         | 8.75       | 0          | 17         | 0          | 18         | 0          | -                    | 67  | F   | Hay-fever 35 years ago; cerebral hemorrhage; urticaria                                           |
| Dilatations               | ..                         | ..                  | +                   | Albumin              | 18                       | 8          | 11         | 10.7       | 27         | 0          | 30         | 0          | -                    | 45  | M   | Hay-fever every spring; alcoholism                                                               |
| .....                     | ..                         | ..                  | ..                  | .....                | 20.4                     | 8.6        | 12.4       | 15         | 10         | 0          | 22.4       | 0          | +                    | 52  | M   | Hay-fever every fall; sensitization to halibut; myocarditis; formerly dipsomania                 |
| .....                     | +                          | +                   | ..                  | .....                | 16                       | 8          | 11         | 0          | 20         | 0          | 24         | 0          | -                    | 58  | M   | Asthma; emphysema                                                                                |
| .....                     | ..                         | ..                  | ..                  | Albumin              | 20.8                     | 14.2       | 11.2       | 18         | 7.4        | 0          | 7.4        | 0          | -                    | 43  | M   | Slight attack of hay-fever 45 years ago                                                          |
| .....                     | ..                         | ..                  | ..                  | .....                | 20.4                     | 9.8        | 14.2       | 21.4       | 16.4       | 12         | 20         | 4.8        | -                    | 39  | M   | Scarlet fever with kidney involvement at 4; urticaria 20 years ago                               |
| .....                     | ..                         | ..                  | ..                  | .....                | 18.8                     | 14         | 11.8       | 19.6       | 15.4       | 12.4       | 22.2       | 0          | -                    | 50  | M   | Angioneurotic edema when a dental student 20 years ago; alcoholism                               |
| .....                     | ..                         | ..                  | +                   | .....                | 17.2                     | 5.8        | 10.8       | 22.4       | 13.4       | 7          | 21.4       | 7          | -                    | 44  | M   | Angioneurotic edema 3 years ago; dermatographia                                                  |
| .....                     | ..                         | ..                  | ..                  | .....                | 14                       | 10.8       | 12.6       | 25         | 10         | 15.4       | 17         | 12.4       | -                    | 39  | M   | Grandfather had asthma; drug addict (?); urticaria 10 years ago; sensitization to sweet potatoes |
| Granulations              | ..                         | ..                  | ..                  | .....                | 14.8                     | 12.4       | 12.4       | 19.2       | 13.4       | 9.2        | 16.2       | 7          | -                    | 29  | M   | Sugar in urine formerly; alcoholism; urticaria in 1922; tremor                                   |

tions that are constantly taking place. We have emphasized this point of view in our study of the lymph changes during shock, etc.<sup>2</sup>

1. Nathan, E., and Stern, F.: *Klin. Wchnschr.* **7**:1375, 1928.

2. Petersen, W. F.; Milles, Geo., and Müller, E. F.: *Ztschr. f. Exper. Path. und Therap.* **60**:336, 1928; Petersen, W. F.; Müller, E. F., and Boikan, W.: *J. Inf. Dis.* **41**:405, 1927.

The angioneurotic edemas and the urticarias studied seemed to be characterized by a short blister time and a relatively high inflammatory index. During an attack, the K/Ca ratio appeared to be lower. In general, the sugar level was higher. The menstrual urticaria was associated with a relative acidosis, and the reaction to epinephrine, in contradistinction to the reaction in other cases, was sympathetictonic. Changes in the capillaries of the skin and changes in the urine were, of course, commonly associated. The intracutaneous reactions to the pharmacologic substances injected were not characteristic.

The small group of persons with gastro-intestinal sensitization all had high calcium levels and low K/Ca ratios. In two, however, distinct vascular diseases (Raynaud's and Buerger's) were associated.

Of the six persons with a history of hay-fever, three had glaucoma. Here the blood chemistry was changed so far as the K/Ca ratio was high. All were distinctly vagotonic and the capillary permeability was low in each case.

On the other hand, the persons with a history of previous angioneurotic edema and urticaria seemed to be of a somewhat different type. They were distinctly nervous and had low K/Ca ratios, but were, nevertheless, distinctly vagotonic. With two exceptions, both highly nervous persons, all showed low permeability. These two patients (nos. 77 and 80) had high resistance of the skin to electric current, high permeability of the capillaries and lessened thyroxin wheals.

The endothelial reaction of Rumpel-Leede did not seem to be characteristic for the groups.

When we turn to the reaction to the subcutaneous injection of epinephrine hydrochloride, the results in the cases of rapidly fatal disease are of considerable interest. The results are preponderatingly vagotonic, while those in the cases in which the patients lived longest were generally sympathetotonic.

## B. DETAILED STUDY OF THE REACTIONS OF PERSONS WITH TUBERCULOSIS

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### BLISTER TIME

In a study of the blister time of tuberculous persons in relation to our group of 100 "normal" men, we pointed out that the persons with roentgen evidence of active tuberculosis (chronic) have, in general, a longer blister time; and in a previous study,<sup>1</sup> we demonstrated that the blister time of those with moderately advanced tuberculosis was prolonged over that of the 100 "normal" men, but that, with advance of the disease, the blister time shortened progressively. The average blister time of our group of 100 "normal" men was 7.5 hours; for the twenty truly normal persons in this group, it was 6.8 hours. For those with roentgen evidence of active tuberculosis, it was 8.4 hours, and for the group of eighty-three tuberculous patients it was 7.4 hours.

To obtain a survey of the relation of the blister time of the tuberculous patients to the clinical status and to the status in the other tests,

1. Levinson, S. A., and Petersen, W. F.: *Am. Rev. Tuberc.* **15**:681, 1927.