

# IMPAIRMENTS IN A RURAL POPULATION

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## III. PHYSICAL EXAMINATION AND LABORATORY DATA<sup>1</sup>

IN PORTRAYING the results of an analysis of medical examinations, the temptation is great to overstress the more objective findings of the physical examination. The physical examination, however, is likely to bring out the objective findings that can be seen, heard or felt, to the exclusion of more unobtrusive but frequently quite as significant pathology. Moreover, few even of the objective findings indicate the presence of diseases or defects when taken by themselves. Of what significance, for example, is the highly objective physical finding of an abdominal mass or the laboratory findings of urinary albumin or blood in women of child-bearing age? Yet these are not isolated examples. Even the dermatologist finds himself hardly less than the internist under the necessity of making a number of quite subjective observations in determining the significance of his findings.

The degree to which the history record can supplement these limitations has been discussed in introducing the history data. There are, however, many instances in which the history data fail to give enough information to determine significance or to establish a diagnosis. This gap has been filled very materially in many cases by special examinations: laboratory, X-ray, and clinical. Of these special tests, urinalysis and chest X-ray only were used routinely at the clinic, and both were found most useful supplements for their respective fields. The record remains, however, incomplete and probably therefore minimal in several important respects, including eye and ear, dental, gastro-intestinal, and gynecological defects.

A final qualification of the significance of physical findings may

<sup>1</sup> This is the third in a series of notes on the physical status of a rural population. The first appeared in the Milbank Memorial Fund *Quarterly* for July, 1937, and the second in the October issue.

be introduced by the examiner and the type or pattern of examination made. In the present instance, two different examiners performed the larger part of the examinations, and somewhat different examinations were performed by each. Where the two were found to cover the same ground, it has already been noted that rather strikingly uniform findings were secured; but where it is known that one examiner made extra observations, the records of that examiner were used both for the findings and for the population base in determining rates. For this reason, case totals have been omitted from the table of this section and are recorded in the text only as an index of the relative prevalence of specific conditions in grouped categories.

With these observations on the nature of the findings of the physical and laboratory examinations in mind, the data presented in Table 5 may be reviewed. As in the case of the history data offered in Table 4, these data are in the form of crude percentages corrected for sex and percentages standardized for age and sex, the latter designed to indicate the prevalence of stated findings in a white population of the type found in the rural United States. For reasons previously given, the true sample rates are felt to represent in general minimum, and total sample rates maximum, values.<sup>2</sup>

**WEIGHT.** Weight and height determinations at the clinic were made before the subjects removed their house garments or shoes. An allowance had therefore to be made on both weight and height readings, and the data may therefore be regarded as approximate only. A record was kept of the physical appearance of the patient, and a more detailed study of these data in relation to those of weight and height is projected.

**EYES.** The eyes were routinely inspected, eye motions and pupillary reactions tested, and vision measured by Snellen test chart. Most of the defects noted in the inspection of the eyes were acute or were

<sup>2</sup> *Italics* have been used in the table to indicate more detailed subdivisions of the broader categories first presented.

symptomatic of other types of illness; a few were definitely localized to the eye and achieved importance because of their effect on vision so that it seems more logical to discuss them in that connection. *Distance vision* only was measured, and the degrees of defect found for one or both eyes have been shown successively. In the first category (20/30 or worse), there were 265 cases for the total sample. The most frequent causes of the very prevalent deficiencies noted were probably refractive errors which could be, and to a very limited extent were, corrected by glasses. Strabismus was recorded only fifteen times in the total sample and was usually associated with marked differences in the vision of the two eyes.

The data on *blindness*, or virtual blindness, refer likewise to the vision of one eye or both, but data for all ages are included. In five cases only was there bilateral involvement; in two of these the cause appeared to be bilateral cataract; in one a long-standing case of glaucoma; in one syphilitic interstitial keratitis, and in one the end results of conjunctivitis in early infancy, probably gonorrheal. The latter two cases were materially improved after the clinic visit, the first by antisiphilitic therapy and the second by operation. Twenty patients showed unilateral blindness: ten from unknown causes, four from former injury, four from cataract, and two from strabismus.

EARS. The data on the ears include the findings for some 700 individuals examined with an otoscope. In this group *impacted cerumen* was found to be quite prevalent, commonly in one ear only. As an effort was made to see the ear drum, the wax was usually syringed out and not infrequently small foreign bodies (beans, wads of paper, etc.), inserted in early childhood, were found in the wax. *Deafness* was measured solely by the necessity of conversing with the patient in raised tones, and therefore applies primarily to bilateral deafness of more than moderate degree. Causes underlying the condition were not often found. Making the total for the category of *other ear* are eight cases of the group exam-

| FINDING  | PERCENTAGE WITH STATED FINDING <sup>2</sup> |              | PERCENTAGE STANDARDIZED FOR AGE AND SEX <sup>3</sup> |              |
|--|---|--------------|--|--------------|
|  | True Sample                                 | Total Sample | True Sample  | Total Sample |
| Weight   |   |              |  |              |
| 20 per cent or more overweight, relative to height and age <sup>4</sup>  | 12.0  | 13.4         | 12.3   | 12.5         |
| 15 per cent or more underweight, relative to height and age <sup>4</sup> | 6.5   | 7.6          | 6.9  | 7.5          |
| Eyes, Distance Vision  |   |              |  |              |
| 20/30 or worse, one or both eyes without glasses <sup>5</sup>            | 37.3  | 44.7         | 38.7   | 40.5         |
| 20/40 or worse, one or both eyes without glasses <sup>5</sup>            | 25.5  | 32.7         | 26.6   | 28.8         |
| 20/50 or worse, one or both eyes with glasses <sup>5</sup>               | 20.0  | 26.0         | 21.1   | 22.3         |
| Blind or perceiving movement only, as above                              | 1.4   | 2.0          | 1.6  | 1.8          |
| Ears   |   |              |  |              |
| Impacted cerumen   | 11.4  | 11.2         | 11.6   | 10.8         |
| Marked deafness <sup>6</sup>   | 1.6   | 2.6          | a  | 2.1          |
| Other ear  | 1.7   | 1.8          | a  | a            |
| Nose   |   |              |  |              |
| Deviated nasal septum, moderate or marked                                | 8.0   | 11.0         | 8.4  | 10.4         |
| <i>Deviated nasal septum, marked only</i>                                | 2.2   | 2.4          | a  | 2.3          |
| Hypertrophy of turbinates  | 4.2   | 4.6          | 4.1  | 4.7          |
| Other nose   | 1.7   | 2.0          | 1.7  | 2.0          |
| Mouth  |   |              |  |              |
| Pyorrhea and gingivitis  | 14.3  | 14.7         | 15.5   | 14.1         |
| Dental caries, one or more cavities                                      | 41.1  | 38.7         | 40.6   | 39.2         |
| <i>Dental caries, five or more cavities</i>                              | 12.2  | 11.5         | 12.1   | 11.1         |
| Teeth lost, one or more missing  | 47.4  | 53.9         | 51.1   | 50.8         |
| <i>Teeth lost, one set or both</i>                                       | 13.9  | 20.0         | 16.0   | 16.6         |
| Other mouth  | 1.7   | 1.9          | 1.7  | 2.0          |
| Throat   |   |              |  |              |
| Tonsils enlarged, buried or infected                                     | 46.0  | 43.0         | 46.2   | 42.4         |
| <i>Tonsils enlarged</i>  | 26.7  | 22.8         | 24.6   | 22.9         |
| <i>Tonsils buried</i>  | 16.5  | 17.4         | 18.4   | 16.6         |
| <i>Tonsils infected</i>  | 7.9   | 8.3          | 8.2  | 8.2          |
| Thyroid  |   |              |  |              |
| Diffuse or nodular enlargement   | 2.8   | 2.9          | 2.9  | 2.6          |
| <i>Diffuse enlargement (simple goiter)</i>                               | 1.5   | 1.7          | 1.6  | 1.5          |
| Heart  |   |              |  |              |
| Heart disease, all forms   | 1.8   | 3.6          | 2.5  | 3.1          |
| <i>Valvular and congenital</i>   | 0.4   | 1.0          | a  | a            |
| Blood Pressure   |   |              |  |              |
| Systolic pressure, 160+ mm. <sup>5</sup>                                 | 9.2   | 13.2         | 9.0  | 9.4          |
| Lungs (including X-ray findings)   |   |              |  |              |
| Nontuberculous pulmonary disease   | 0.6   | 1.5          | a  | 1.4          |
| Abdomen  |   |              |  |              |
| Findings interpreted as gastro-intestinal                                | 1.2   | 1.3          | a  | 1.3          |
| Findings interpreted as female genital <sup>7</sup>                      | 1.3   | 1.5          | 1.3  | 1.5          |
| Renal ptosis   | 1.3   | 1.2          | a  | 1.2          |
| Hernia, all forms  | 3.0   | 5.4          | 3.4  | 4.6          |
| <i>Hernia, inguinal</i>  | 2.2   | 4.4          | 2.6  | 3.6          |

| FINDING   | PERCENTAGE WITH STATED FINDING <sup>2</sup> |              | PERCENTAGE STANDARDIZED FOR AGE AND SEX <sup>3</sup> |              |
|---|---|--------------|--|--------------|
|   | True Sample                                 | Total Sample | True Sample  | Total Sample |
| <b>Male Genital<sup>4</sup></b>                 |   |              |  |              |
| Hydrocele <sup>5</sup>                          | 2.2   | 3.2          | 2.8  | 2.8          |
| Varicocele <sup>5</sup>                         | 8.8   | 8.1          | 11.6   | 7.4          |
| Other genital <sup>5</sup>                      | 4.0   | 5.6          | 4.0  | 5.7          |
| <b>Spine</b>                                    |   |              |  |              |
| Kyphosis and scoliosis                          | 4.4   | 7.4          | 4.9  | 6.7          |
| Other spine                                     | 0.8   | 2.2          | a  | 1.9          |
| <b>Extremities</b>                              |   |              |  |              |
| Flat foot and foot strain                       | 2.8   | 3.1          | 3.0  | 2.7          |
| Varicose veins                                  | 2.4   | 4.8          | 2.8  | 4.0          |
| Arthritis, all forms                            | 3.5   | 4.5          | 3.9  | 3.6          |
| <i>Arthritis, hypertrophic or atrophic only</i> | 2.3   | 3.1          | a  | 2.5          |
| Injuries  | 3.1   | 3.7          | a  | 3.4          |
| Other extremities                               | 1.8   | 2.2          | a  | 2.0          |
| <b>Central Nervous System</b>                   |   |              |  |              |
| All organic findings                            | 0.5   | 1.1          | a  | 1.2          |
| <b>Skin</b>                                     |   |              |  |              |
| All dermatological conditions                   | 9.0   | 12.1         | 9.0  | 11.6         |
| <b>Laboratory (Urinalyses)</b>                  |   |              |  |              |
| Albumin (all degrees)                           | 3.8   | 3.8          | 3.9  | 3.8          |
| Glycosuria (all degrees)                        | 4.4   | 4.9          | 4.6  | 4.2          |
| <i>Glycosuria (1 per cent or more)</i>          | 1.2   | 1.3          | a  | a            |
| Sediment, white cells numerous                  | 5.4   | 4.2          | 5.2  | 4.1          |
| <b>General Conditions</b>                       |   |              |  |              |
| Arteriosclerosis                                | 3.1   | 4.6          | a  | a            |
| Nephritis, acute and chronic                    | 1.2   | 1.8          | a  | 1.6          |
| Diabetes  | 1.5   | 1.4          | a  | 1.2          |
| Anemia  | 0.5   | 1.0          | a  | a            |
| Syphilis, clinically evident                    | 0.0   | 0.6          | —  | a            |
| Cancer  | 0.2   | 0.4          | a  | a            |

<sup>a</sup> Limited numbers make standardization impossible.

<sup>1</sup> The total sample examinations came to 1,224 of which 560 were performed on males and 664 on females. Of these, 744 formed the true sample: 349 males and 395 females. In the case of defects of the ears, male genitals, and extremities, and in the rates for inguinal hernia and syphilis, the population and cases of a single examiner were used.

<sup>2</sup> The crude percentages have been corrected for sex.

<sup>3</sup> Standardized to rural white population, United States Census, 1930.

<sup>4</sup> Medico-actuarial tables used for adults; Baldwin-Wood tables for children under 20.

<sup>5</sup> Not tested under 5 years of age; data based upon persons examined, 5 years of age and older.

<sup>6</sup> Applies to bilateral deafness and was measured only by the need for conversing in raised tones.

<sup>7</sup> Rates based on females examined only.

<sup>8</sup> Rates based on males examined only.

Table 5. Percentage of all examined persons<sup>1</sup> in the true and total samples with specified findings determined primarily on the basis of physical or laboratory examination.

ined otoscopically in which pus discharge from one or both ears indicated an otitis media which was either chronic or recurrent, and five cases in which the ear drum appeared on otoscopic examination markedly scarred, thickened, or perforated. Some history data, omitted from the history section because it was planned to introduce them at this point, have supplemental interest in connection with the above data on chronic or old healed otitis. All persons examined at the clinic were questioned on previous history of "ear discharge," acute or chronic. Eighty-four persons answered in the affirmative for the total sample. If reliance may be placed upon the history data, therefore, 15 to 16 per cent of the cases of otitis media result in chronic otitis or in marked ear drum changes in this area.

**Nose.** The anterior nares were examined with a nasal speculum. The disorders and defects of the upper respiratory passages are particularly difficult to classify because in not a few cases the normal and pathological variations are frequently matters of opinion. It has, however, seemed possible to present the data in enough different ways so that different criteria as to pathology could be satisfied. *Deviated nasal septum* did not *per se* cause nasal occlusion so that only marked degrees of this condition may have significance. In only three instances out of a total of twenty-five cases was marked nasal septum deviation traceable to former injury of the nose with fracture. *Hypertrophy of turbinates* was comparatively prevalent, and the variation from normal therefore not easily established; it is in conditions such as this that the data tend automatically to be recorded in the direction of marked rather than minimal or moderate. *Other nose* includes for the total sample twenty-two individuals: three with nasal polyps, two with extensively perforated nasal septum, and the remainder with chronic nasal and postnasal discharges otherwise unclassified.

**Mouth.** The examination of the mouth included study of the lips, gums, teeth, and tongue.

*Pyorrhoea and gingivitis* include a number of cases with simple

deposits at the gum line due to neglect of teeth; the differentiation of pyorrhea from the latter condition should have been made a routine part of the examination.

*Dental caries* was found to be very prevalent after the age of three years. Where extensive caries was encountered in the deciduous teeth of young children, an almost invariable finding was that the mother admitted a definite aversion to the use of milk in her own diet. The same correlation could not be drawn between extensive caries in the second set of teeth and the patient's own diet. Unfortunately, no specific data were recorded on either of these points.

The data on *teeth lost* are chiefly of significance where a large enough number have been lost to affect mastication. It was found impractical to attempt a distinction between deciduous teeth lost and permanent ones, so that where one or two teeth were missing at younger ages the data include such developmental losses. A not uncommon finding in persons with one or both sets of teeth removed was that dentures were not used to replace the missing set or sets. In some instances dentures had been made but their use discontinued because of discomfort, breakage, or loss.

The category of *other mouth* includes five cases of alveolar abscess (one with osteomyelitis of the jaw), four cases of lingua geographica, four cases of markedly defective eruption of teeth, two cases of superficial infection (angina and thrush), two cases of hare lip (one associated with a high degree of cleft palate), and three conditions not easily classified.

THROAT. Few physical examination findings are more difficult to classify than those of the *tonsils*. The data are presented here in detail and in what seems the most useful combination of the three individual categories. It may be recalled that the findings of two examiners, working quite independently over two different periods, agreed quite closely on these as on many other findings. Mere agreement upon objective findings is not, however, sufficient

grounds for establishing their significance. Tonsillar status can best be evaluated on repeated examination and in conjunction with the record of illness attributable directly or indirectly to tonsil disease. Neither of these supplementary observations were fully available to the clinic examiners, and the tonsillar findings must, therefore, remain as classic examples of objective findings whose significance remains doubtful because of lack of further information.

*Thyroid.* The thyroid was palpated and slight degrees of physiological enlargement (at puberty and menstruation in women) not infrequently found. These were not included in the data given here. *Diffuse or nodular enlargement* were rarely encountered in men. *Diffuse enlargement* was uncommon in this section of the country which lies somewhat east of the "goiter belt."

The thyroid findings offer another good example of the discrepancy between the significance of simple objective findings and that of more generalized observations. Only six persons in the total sample showed clinical evidence of thyroid dysfunction: three instances of hypothyroidism, and three of hyperthyroidism. The former consisted of two cases apparently congenital, and one following an operation for hyperthyroidism. The latter were cases of adenomatous goiter, one in an advanced toxic stage. Four persons had undergone thyroidectomy prior to coming to the clinic.

**HEART.** The heart was examined by percussion and auscultation. History data and X-ray findings were also taken into account, the latter with recognition of the limitation of a four-foot plate in determining absolute and relative heart measurements. Data on heart defects must be interpreted with the same reservations as those made for other serious conditions, namely, that advanced stages were unable to come to the clinic for examination.

*Heart disease, all forms,* includes a total of forty-four cases of which all but thirteen were cases of chronic myocarditis in elderly persons. The single case of advanced hyperthyroidism noted above showed cardiac changes, and is also included in this group. Mod-



erate degrees of cardiac enlargement on physical and X-ray examination were more commonly encountered than the figures here given would suggest, but the history and other data were not always confirmatory. Few of these cases showed edema or other evidence of decompensation and only one showed auricular fibrillation.

Valvular and congenital defects made up the balance of the conditions listed under the foregoing general heading. They occurred chiefly in younger persons and were divided for the total sample as follows: mitral stenosis, five cases (two with aortic stenosis as well); mitral regurgitation with enlargement, one case; aortic regurgitation, three cases (two proven syphilitic); pulmonic stenosis, two cases; coarctation of the aorta, one case; and finally, one case with marked enlargement of the heart present, according to history from birth, but unclassified.

**BLOOD PRESSURE.** Blood pressure was measured on the first 500 patients with a mercury manometer, and on the last 700 with an aneroid manometer checked periodically against the mercury instrument. The patient was usually seated when tested. The measurement of blood pressure was a new experience to many of the patients, and this, together with the fact that one observation is commonly regarded as fallible, caused some uncertainty as to the usefulness of reporting these data. However, it was found possible to re-test twenty of the 118 persons here reported as hypertensive during a period of a few months to three years after the original reading in the more familiar surroundings of their own homes. Of the twenty, five dropped below 160 on the subsequent test, an apparent "error" in the first measurement of 20 per cent. However, the diastolic pressure in all but one of these cases remained elevated, 95 mm. or more; and the impression is that a more complete re-test would have eliminated very few actually hypertensive persons from the original list.

**LUNGS.** The lungs were examined by auscultation, percussion, and X-ray, the latter consisting of a flat plate in the case of 400

patients and two stereoscopic plates in the remaining 800. Pulmonary disease was suspected on the basis of history or physical findings more frequently than it was detected on X-ray, but serious pulmonary disease was seldom disclosed by the X-ray when the examiners had not already suspected it. The suspicion was, however, frequently a non-specific one, and the X-ray usually aided greatly in making the diagnosis more exact.

Pulmonary tuberculosis was one of the distinctly uncommon clinic findings, in part because known cases were not invited during the earlier period of clinic operation. Only two cases of active pulmonary tuberculosis were found in the total sample. The clinic findings on this and other types of tuberculosis will be taken up in a separate analysis.<sup>3</sup>

*Non-tuberculous pulmonary disease* includes seven cases with a tentative diagnosis of bronchiectasis, three cases showing delayed resolution of (or unresolved) pneumonia; two cases with chronic pulmonary emphysema; one case with pulmonary infarct from a syphilitic ulcer of the leg; one case with anthracosis (the patient was formerly a coal miner); one case with silicosis (the patient had been a knife-grinder); one case with cancer of the lung; and two cases with lung lesions as yet undiagnosed.

ABDOMEN. The abdomen was examined by inspection and palpation. *Findings interpreted as gastro-intestinal* were notably few. The symptomatic data presented in the history section indicate that there were many more defects (perhaps largely functional in character) than those actually found. This discrepancy points to one of the signal limitations of routine methods used in the physical examination of the abdomen. The special tests of the function of the gastro-intestinal tract are far too exacting to apply as a routine, and it seems probable that the best solution for the problem of

<sup>3</sup> An analysis of the X-ray findings, with special reference to tuberculosis, of nearly three-quarters of the clinic patients has been made by Dr. John H. Korns: Tuberculosis in a Rural Population. *The Milbank Memorial Fund Quarterly*, January, 1934, xii, No. 1, pp. 47-56.

identifying and appraising gastro-intestinal defects is a very considerably more detailed history.

The cases listed showed for the most part indirect evidence of gastro-intestinal disease, such as spasm and tenderness. One was referred directly for operation and proved to have chronic cholecystitis with calculi.

Findings interpreted as *female genital* were limited to those detected during the course of the abdominal examination and included only ten cases considered to have benign uterine or ovarian tumors. These constitute important defects but are of course not nearly so prevalent as such conditions as uterine malposition, cervicitis, and other defects, which have to be excluded from the present study from lack of data.

*Renal ptosis* was considered more often than the figure of eleven cases for the total sample would indicate. These eleven represented the more advanced cases encountered. It is noteworthy that few showed symptoms suggesting Dietl's crisis.

*Hernia, all forms*, was a relatively common finding. Inguinal hernia formed the largest part of the total and will be discussed below. The remainder consisted for the total sample of eleven cases: umbilical hernia, seven; femoral hernia, three; and post-operative hernia, one. In two instances there was found marked diastasis recti and in one instance eventration of the diaphragm not included above.

When questioned during the course of history-taking on the subject of whether they had, or had previously suffered from, "rupture," a standardized 5.6 per cent of persons in the total sample replied in the affirmative. In most instances where a hernia was thus indicated but not found at examination, a history of operation was secured, and it may be deduced that about 20 per cent of hernia cases are operatively treated in this area.

There were twenty-five cases of *inguinal hernia*: twenty-one in males and four in females. In thirteen additional instances among

males the inguinal ring was found to be dilated, but further evidence for hernia was not detected. This latter condition was not considered a defect, although it may have potential significance.

**MALE GENITAL.** Males were examined for gross defects but the omission of a rectal examination makes the data somewhat incomplete, for prostatic hypertrophy is relatively common at later ages.

*Hydrocele* was not uncommon and frequently reached a considerable size.

*Varicocele* was the most prevalent male genital finding, but was seldom of extreme grade.

*Other genital* includes nine cases of undescended testis (bilateral in only one instance); six cases with atrophic testes (noted in four instances as dating from an attack of mumps), and one case recorded as showing an epididymal cyst. Three of the first mentioned nine cases were small boys who were being treated or had been treated for hernia.

Exact data on *gonorrhoea* are notably lacking from both male and female examinations. No acute cases were seen in males although a history of previous attack was occasionally given, but two cases previously diagnosed as gonorrhoeal vaginitis were seen in female children, and two cases of infection were suspected but not confirmed in adult females. These figures can in no sense be regarded as complete because adults aware of having gonorrhoea undoubtedly stayed away from the clinic.

**SPINE.** This was examined by inspection, and added information, especially as to scoliosis, was obtained from the chest X-ray.

*Kyphosis and scoliosis* were found separately as well as combined in the same individual, and the data include both individual and combined occurrences of more than slight degree.

*Other spine* includes twenty-two individuals: twelve with characteristic physical findings of sacro-iliac syndrome, four with a rigid or "poker" spine, four with marked lumbar lordosis, and two with evidence of fracture following old injury.

Not included in the above are five cases of cervical rib, observed on X-ray of the chest. The condition was asymptomatic in all but one instance.

**EXTREMITIES.** The extremities were examined by simple inspection, primarily for the more common defects listed here. A limited number of cases showing changes in the extremities were due to nervous system defect and are listed under that heading.

*Flat foot and foot strain* are probably more common than these figures indicate as a number of persons, particularly women, wore metal plates in their shoes. The exact extent of the defect was not then readily ascertainable, nor was it under those conditions a definite handicap.

*Varicose veins* were comparatively common in women, and sometimes very extensive degrees were found. Only one varicose ulcer was encountered, but scars of old, healed ulcers were more frequent.

*Arthritis*, as used here, includes not only the two classic types mentioned below but also the localized type which develops and persists after injury to a joint—often a fracture involving the joint. The traumatic form of arthritis was encountered frequently enough to make it seem worth listing under this heading, there being nine examples of it in the total sample. It is possible that it plays a more important role in a rural population as a cause of joint pain than in an urban one.

*Arthritis, hypertrophic and atrophic*, includes the two generally accepted types of chronic arthritis as distinguished from the traumatic. The form which was entirely or largely hypertrophic was observed thirteen times, and the atrophic six times. Three cases were unclassified. It may be noted that a wide discrepancy exists between the history data and physical findings for these conditions.

*Injuries* include cases of gunshot wounds, industrial accidents, and other mishaps involving the extremities; cases of traumatic arthritis listed above are also included here. Four cases were seen

with old neglected fractures of arm or leg, untreated despite the knowledge that fracture had taken place.

*Other extremities* is a category embracing fifteen cases showing a wide diversity of pathology. Three patients had congenital club foot, two of whom had had partial correction; another showed the only case of active tuberculosis of bone (the humerus diagnosed at operation) encountered in the clinic; three showed definite edema of the lower extremities which could not be accounted for.

**CENTRAL NERVOUS SYSTEM.** Indications of disease of this system were obtained by noting defects of eye movement, pupillary reactions, and deep reflexes: biceps, triceps, and quadriceps. Persons showing deficiencies in these were usually given a somewhat more intensive neurological examination in the hope of making a diagnosis. The defects of this system, like those of the gastro-intestinal system, appear to be largely functional or occult and therefore best explored by careful history-taking. Only thirteen patients were found to have organic evidence of central nervous system disease, and of these not all showed primary afflictions of that system. Three showed residual paralysis from former attacks of infantile paralysis; three showed paralysis resulting from cerebral hemorrhage or embolism; two showed wrist and toe-drop, respectively, attributed to lead poisoning (both were painters by trade); one showed a quite generalized paralysis dating from an attack of diphtheria many years previously; one showed evidence of cerebral birth injury; one had paralysis and gave a history of epileptiform attacks following head injury (subdural hematoma); and finally, two conditions not easily classified were diagnosed by a consultant as encephalomyelitis and meningomyelitis, respectively.<sup>4</sup>

**SKIN.** The skin was examined simply by inspection during the course of the general examination, and a varied pathology was disclosed. The most prevalent condition was acne, of which eleven instances were discovered of more than average severity. The

<sup>4</sup> Dr. John L. Eckel of Buffalo very kindly reviewed these two cases for the clinic.

always unsatisfactory diagnosis of "eczema" was next in frequency with nine cases, only one of which was generalized and severe. Tinea, or ringworm infections, were the next in prevalence, with seven cases. The examiner felt that this condition was relatively uncommon. Scars from extensive old burns (with contracture), generalized keratosis senilis and pruritus from undetermined cause were next in order, with four cases of each. The remaining forty-nine cases were scattered over a wide field of skin defects.

LABORATORY (*Urinalyses*). Urine specimens were collected at the clinic in special bottles<sup>5</sup> and examined with the cooperation of the Cattaraugus County Health Department laboratory.

*Albumin* was reported in thirty-nine cases, of which seventeen were considered to be cases of acute or chronic nephritis and will be discussed below. Two others were attributed to orthostatic albuminuria, and the remaining twenty cases were considered of doubtful significance.

*Glycosuria* was also comparatively common, but in the majority of instances was found in very small amounts and in concentrated specimens suggesting reduction from other causes than sugar. The more significant degrees of glycosuria (over 1 per cent) are seen to be less common.

*Sediment* was found to offer data of uncertain significance owing to the conditions of collection and storage of the specimen prior to examination. *White cells* were the most commonly reported elements and are entered here only when reported as present in large numbers. In only six of the total of forty-three cases were burning or frequency mentioned in the history, and this, together with the fact that three-fourths of the patients with pyuria were females, makes the remaining cases of doubtful significance. To add to the value of this and other urinalysis "objective" findings, a very

<sup>5</sup> Bottles contained a mixture of powdered hexamethylenamine, three parts, and salicylic acid, two parts, as preservative. The urine was sent to the County laboratory for examination which was usually performed within eighteen hours. Albumin was tested by nitric acid ring test; sugar by Benedict's qualitative test, and the amount—when present—measured by Benedict's quantitative method.

detailed history of the entire genito-urinary tract should be incorporated in the routine examination.

**GENERAL CONDITIONS.** A certain number of conditions, whose prevalence in a general population is usually conjectural, were observed at the clinic. Their identification, however, rested upon a variety of observations and hence they can be listed under no one organ or system heading.

*Arteriosclerosis* was suspected not only from the observation of thickened or tortuous arteries, but also from ophthalmoscopic, X-ray, and other sources. The data here given apply to marked cases because some degree of arterial change seems to be almost invariable at the older ages.

*Nephritis* was considered in connection with albuminuria, hypertension, and urinary complaints. Of the seventeen cases included here, five were acute in character, and four of these followed acute throat infections. The acute cases showed gross blood as well as albumin in the urine, and there was slight, if any, rise in blood pressure. All were children under twelve years of age; one child died a year after examination. The chronic cases were elderly and usually showed marked hypertension.

*Diabetes* was diagnosed in large part by the urinalysis findings, together with the observations made by physicians to whom cases were referred. Fifteen patients were thus identified, of whom eight had been previously diagnosed as having diabetes, and seven were first discovered at the clinic. Of the former (those already diagnosed), only one was sugar-free and others showed urinary sugar up to 5.0 per cent, the average for the eight being 2.2 per cent. Of the eight patients first diagnosed at the clinic, urinary sugar varied between 1.1 and 4.1 per cent with an average of 2.1 per cent for the group. The patients with foreknowledge of their condition did not in general appear much interested in holding it in check by careful dieting or treatment, although at least one was taking regular chiropractic treatment. Two of the newly discovered patients



refused to follow rational treatment when their diabetic status and its consequences were carefully explained to them. Patients with high blood pressure were much more cooperative about keeping their hypertension under observation.

Two children with advanced diabetes, in one family, died within a year of the clinic visit.

*Anemia* was recorded chiefly when of a marked and noticeable degree; few cases were checked by blood counts. A total of thirteen cases was found. The basic cause was seldom found. In one case it appeared to be a lack of iron in the diet; in one case there was an associated leukemia; one patient had been reliably diagnosed as having pernicious anemia; one had lead poisoning; one gave a history of menorrhagia, and the remainder were unclassified.

*Syphilis.* The study was not designed to discover latent syphilis as routine neurological and hematological tests were not included. However, an attempt, usually successful, was made to secure blood for Kline and Wassermann tests where suspicious findings were encountered. Thirty such tests were made, but positives were only encountered, as it chanced, where the clinical evidence pointed strongly toward the infection. Four cases were detected out of 715 persons. Two of the four had been diagnosed prior to the clinic visit and were under treatment; two were unaware of their disease. No cases were seen in the primary or secondary stages. It seems probable that most persons with knowledge of past infection would not have accepted the clinic invitation, so that these data are undoubtedly low even for clinically manifest syphilis.

*Cancer* was encountered only five times in the total sample, once each as follows: cancer of the lip (recurrent after three years); cancer of the lung (proved at autopsy); cancer of the uterus; cancerous growth in the mediastinum; and metastatic cancer, originally of the breast. In three of the five cases, diagnosis was originally made in the clinic.

The services of the State Cancer Clinic in Buffalo were invaluable

in the examination of patients suspected at the clinic of having cancer. It was the examiner's impression that that institution offered a very definitely needed service in western New York State.

#### DISCUSSION

The limitations in the interpretation of physical and laboratory findings have been shown to be many, but they are not felt to be insuperable. The real problem presented by the collection and analysis of such data as these is in the differentiation between normal and pathological states. The examiner of a group of relatively "healthy" individuals encounters with rather surprising frequency pathological conditions which he was accustomed to regard as incompatible with health, if not of life, in individuals apparently secure in the tenure of both. These cases are seldom discussed in textbooks and are infrequently encountered in clinics or consulting rooms where sick persons pass in review. They are usually explainable on the basis of the compensatory activities of nature, and do not in themselves offer much difficulty except that they represent extreme examples of a much more common problem—that of the differentiation of normal from abnormal. The physical examination, and in fact the whole medical examination, is better designed to indicate the existence of pathology than to exclude the possibility of it or of its significance. However useful the routine medical examination proves in the hospital, office, or at the bedside, there is imperative need for more subtle tests than those now in general use, to explore the status of large groups with respect to chronic ailments. Some of these could well be designed to pick up defects of function rather than of form.

These observations are not intended to cast doubts upon the validity of the data presented here, for the examination given at the clinic was a careful one, but to indicate that there is great need for more precise methods of study, more exact knowledge of the limits of normal, and better concepts of the significance of defects. The field covered with such refinements could be made even broader.