

the so-called one-talented child. Not infrequently are the hopes of fond parents crushed by the ultimate realization that the easy mastery of music or some other fine art is the extent of their child's ability. The younger the child, the less prominently do his defects stand out. But as responsibilities increasing with his age are placed on him, his weaknesses become more clearly manifest.

The criminal instinct may frequently be the only indication of a latent defect, and it is only after repeated conflicts with the law that his helpless condition is recognized. During the past three years it has been my privilege to examine a number of children who were referred by the judge of the juvenile court to the psychopathic clinic for examination. One of the most striking observations of this series is the contrast between the relatively high grade of mentality and the type of the crime. It has been a common experience to find a boy of fair intelligence guilty of the simplest forms of criminality. Psychologically, these lads often show evidences of academic ability and even commercial attainments; but after an analysis of their reactions in problems relating to moral procedure, the cause of their downfall becomes apparent.

In detecting the defects of the subnormal mind, it must be recalled that intelligence is composed fundamentally of memory, comprehension and judgment. Under these general headings, there naturally come other subdivisions, such as perception of form, retentiveness, planfulness, concentration, and constructive imagination. Definite psychologic tests must therefore be employed, the results of which will determine the integrity of these mental characteristics. The simple Binet questionnaire serves admirably for the detection of the low and the middle grade types; but when aid is most needed in the recognition of the moron, little dependence can be placed on it. Recently, the Terman revision of this test has greatly enhanced its value, having added many analytic problems as well as introduced a broader field of inquiry.

There is a growing belief among psychologists, however, that standardized performance tests offer the greatest field of usefulness. With such instruments in the hands of competent observers, much may be learned from the patient's reactions. Chief among these may be mentioned the form boards, cubes and cylinders, all of which may be used to advantage in psychologic examinations.

Finally, the practical personal examination of the child is indispensable. No definite syllabus can be followed, but interrogatories must be made to suit the age, and the educational, social and environmental advantages. Moral or ethical problems may be introduced in such a way as to bring out the child's ideas of ethics, which are usually at fault in the defective. It is surprising how frequently a high grade moron shows mature judgment in dealing with generalities, but is absolutely at sea in their practical application. He may be familiar with the laws governing his mode of living, but he fails to see the necessity of applying them to his own activities.

In examinations of this kind, it must be remembered that after all, the ability of the defective to earn a living, to maintain himself independently in the station of life in which he is born, is the supreme test of normality. The necessity, however, of recognizing the lack of this ability before the age of maturity arrives is obvious. When the supposed defect is not real, but is dependent on acquired conditions of a remedia-

ble nature, an early diagnosis is indispensable for complete restoration. Should the evidence, on the other hand, point to a mental enfeeblement, much may be accomplished by specialized training. The judicious selection of the defective's vocation, his mode of living, and other environmental factors depend on the type of the defect. When the deficiency is without the pale of therapy or hope of alleviation, we are in no less degree under obligation to protect the individual and the community in which he lives.

1317 Park Avenue.

THE VALUE OF THE FACE MASK AND OTHER MEASURES

IN PREVENTION OF DIPHTHERIA, MENINGITIS, PNEUMONIA, ETC.*

GEORGE H. WEAVER, M.D.

CHICAGO

Health authorities generally consider that pneumonia, epidemic meningitis and epidemic poliomyelitis as a rule if not always are transferred directly or indirectly from the sick to the well. This places them among the infectious diseases that have previously been considered contagious.

Specific protective measures are available in smallpox, typhoid fever and diphtheria. In the other contagious diseases we must rely on mechanical measures and on germicidal agents and processes for the prevention of their spread.

The use of antiseptic agents in preventing the spread of contagious diseases has been gradually narrowed, and is now largely limited to the disinfection of various secretions and discharges. Even here heat has supplanted them to a large degree. Volatile antiseptics that were formerly extensively employed in fumigation have been largely abandoned as wasteful and inefficient.

The experience of a hospital in which patients with a variety of contagious diseases are housed simultaneously may be of some value in showing the efficiency of certain measures in preventing the production of cross infections among the patients and of infections and carriers among the attendants.

The Durand Hospital has about fifty beds, placed on two floors of a single building connected by stairways and an elevator. Each floor is divided by a corridor with a door at each end opening on the outside. To one side of the corridor are ten isolation rooms, each containing two beds. A common entrance vestibule with lavatory, and common bath room with toilet and lavatory are provided for each two adjoining rooms. On the opposite side of the corridor, at each end, is a small convalescent ward with five and six beds, respectively. Patients on entrance are placed in the isolation rooms, when required two patients in a room, but always only those with a common disease in a suite. Patients from a family are placed together, and when convenient an adult and a child are associated, since the adult is more likely to be immune to the usual diseases of childhood. Several different diseases are often treated on one floor. After isolation for about two weeks, patients with corresponding diseases are transferred to the convalescent wards. Two weeks cover the incubation period of measles,

* From the Memorial Institute for Infectious Diseases.

but not quite that of mumps and chickenpox, and in a few instances patients infected with the latter diseases shortly before entrance have developed them in the convalescent ward. Cultures from the throat and nose for diphtheria bacilli are made on entrance and just before transfer to a convalescent ward. All girls with a vaginal discharge are supplied with individual toilet articles, and do not use the bath tub and toilet used by others.

No fumigation is used in the hospital except occasionally for patients' clothing which cannot be sterilized by steam. No antiseptic solutions are used for washing rooms or for the hands of nurses and attendants. Soap and warm water are used to wash walls, floors and furniture. Bedding is sterilized in an autoclave, as is all laundry before it is washed. All waste, soiled dressings, applicators, tongue depressors, etc., are collected in paper bags and burned. All eating utensils are sterilized by boiling after each use. The nurses and physicians wear caps which completely cover the hair. In the vestibule the nurse puts on the gown which corresponds to the room she is about to enter. On leaving the room she hangs the gown inside out in the vestibule, and thoroughly washes the hands with soap and running warm water. Nurses are impressed with the need of great care in avoiding the transfer of infection from one patient to others, and with the principal rôle of direct carriage, especially by contaminated hands. Except in the case of measles and chickenpox, distant aerial transfer is ignored. The doors of rooms are left freely open, except in case of the two diseases mentioned, when they are kept closed.

From March, 1913, to September, 1917, 2,500 patients were treated in the hospital. Among these patients, nineteen instances of secondary or crossed infection originating in the hospital occurred, that is, in 1 in 131 patients, or 0.76 per cent. These instances are scattered quite evenly among the admissions, seven occurring in each of the first and second thousands and five among the last 500. Almost all the crossed infections developed in isolation rooms, one of the occupants having been infected before entrance and developing the disease in the hospital and infecting the roommate. From the secondary cases no spread was observed. Only two instances of diphtheria were recognized as originating in the hospital. Both were in patients who had scarlet fever, in one of whom it was quite likely that the infection was present before entrance. The six cases of crossed infection by scarlet fever could be accounted for only by direct carriage. Four of these occurred among the first thousand cases, when our method was not fully developed. Our experience would indicate that if each patient could be isolated individually for three weeks, crossed infections could be practically eliminated from hospitals for contagious diseases. The expense of handling patients in this manner is relatively great, but that is counterbalanced by the shortened stay in the hospital and by the elimination of deaths due to crossed infections.

We have made special efforts to protect the nurses from infections, and experience has led us to improve our methods from time to time. The nursing staff has consisted as a rule of about eight graduates and ten pupil nurses. The graduate nurses are specially trained to care for contagious diseases. Pupil nurses are in the hospital three months, and usually have had no previous experience in caring for this class of

patients. From March 12, 1913, to Nov. 1, 1914, sixty-nine nurses were on service in the hospital. Of these, nine, or 13 per cent. acquired clinical diphtheria. Beginning with Nov. 1, 1914, all incoming nurses have been given a Schick test, and those reacting positively have received an immunizing dose of diphtheria anti-toxin. This has been repeated at intervals of three to four weeks during their stay. Since this procedure was adopted, there have been 116 nurses on duty; forty-four have given positive Schick reactions and have been immunized. During this time only three cases (2.6 per cent.) of mild diphtheria have developed. Two of these cases were in nurses who previously had positive Schick reactions and had been immunized. Their period of service being near the end, a retest was neglected, with the result that infection occurred.

Although active diphtheria practically has been eliminated from the nursing staff by this practice, carriers of diphtheria bacilli continued to be detected by weekly throat cultures. From Nov. 1, 1914, to June 1, 1916, ten carriers were found, that is 23.25 per cent. of forty-three nurses. About June 1, 1916, the practice of wearing gauze masks covering the nose and mouth when caring for active diphtheria patients was introduced, and since then six carriers have been detected among the seventy-three nurses on duty, that is, 8.2 per cent.

From March 12, 1913, to June 1, 1916, nine cases of scarlet fever occurred among 112 nurses on duty. Between June 1, 1916, and Dec. 1, 1917, when gauze masks were worn when all patients with scarlet fever in the acute stages were being cared for, no cases of scarlet fever have been observed among seventy-three nurses on duty.

In recent years, so much emphasis has been laid on contact infection in contagious diseases that the possibility of infection through the air at short distances has been sometimes forgotten. Infection through the air for relatively short distances, that is, within a few feet of the patient (or carrier), is quite possible in case the specific agent is present in the secretions of the nose and throat when forcibly thrown out in small particles in forced expiratory efforts, as in coughing, crying or sneezing.

The masks we have used consist of a double thickness of gauze, so shaped as to fit closely over the face from the chin well up over the nose, and held in place by two tapes tied behind the head. A mask is never worn twice until sterilized and washed, and is always replaced by a fresh one when evidently contaminated or when it becomes moist. Little objection is made to wearing the mask, and most nurses now wear them constantly when on duty. The attacks of tonsillitis, pharyngitis and rhinitis that were relatively frequent before the masks were used also have almost disappeared in the last year.

Last spring we cared for fourteen epidemic meningitis patients in the hospital. When caring for these patients, nurses and physicians always wore masks. Systematic nasopharyngeal cultures, repeated at short intervals, failed to reveal a single carrier of meningococci among the nurses and doctors who took care of these patients.

The physicians in the hospital always wear the gauze masks when doing intubations and taking throat cultures, and to a considerable extent when examining patients. Coincident with this use of masks there has been an absence of diphtheria or diphtheria

bacillus carriers among the physicians, and only a limited amount of throat infections.

We feel that great protective usefulness resides in this mechanical measure, and think that it might be used to advantage also by persons caring for pneumonia patients.

In hospitals caring for pneumonia and epidemic meningitis, especially in those that deal with epidemic outbreaks, such as occur in military camps, gauze masks might be used with advantage by all physicians, orderlies and nurses. The importance of carriers in these diseases is apparently very great, and that those about such patients become carriers quite frequently is evident when, as I have learned, not less than 12 per cent. of carriers of meningococci occurred among the personnel of a hospital in which epidemic meningitis patients were treated. The mask not only protects the healthy person from infection and from becoming a carrier, but also prevents a carrier from spreading infection to others. Masks can be used to good advantage also in households in which are patients with diphtheria, pneumonia, scarlet fever, epidemic meningitis or other diseases spread by nasopharyngeal discharges.

637 South Wood Street.

GREENSTICK FRACTURES OF THE FOREARM

CORRECTION OF THE DEFORMITY BY CONTINUOUS ELASTIC TRACTION

WESLEY GROVE VINCENT, M.D.

Fellow of the American College of Surgeons; Associate in Surgery, New York Post-Graduate Medical School and Hospital

NEW YORK

At a meeting of the New York Surgical Society, Nov. 8, 1916, Dr. Alfred S. Taylor¹ described an elastic traction method of treating Volkmann's ischemic contracture. The apparatus consisted of a padded leather sleeve extending from the elbow to the wrist, and to the sides of this sleeve were attached two steel bars, with an adjustable offset at the wrist which could be made to project at any desired angle over the hand and fingers. A broad pad in the palm of the hand was later extended to support the fingers also; and elastic traction was applied by means of ordinary commercial rubber bands which passed under the palmar pad and over the notched projecting steel bars. The size and number of rubber bands varied in accordance with the requirements of the case. Taylor presented one case and reported several others which had been treated by this method with brilliant results, the continuous slight, but insistent, traction, day and night, ultimately overcoming the contracture.

Shortly after I had heard Taylor's paper and had seen the remarkable illustrative case which he presented, it occurred to me that use of the principle of elastic traction as demonstrated by Taylor would be of benefit in greenstick fracture of the forearm in children; but it was about three months later before the opportunity to test the method presented itself.

Bernard M., aged 17 months, came to my clinic at the New York Post-Graduate Hospital Dispensary, Feb. 27, 1917, with a history of having fallen about three weeks previously

1. Taylor, A. S.: Volkmann's Ischemic Paralysis and Contracture, *Ann. Surg.*, 1917, **65**, 28.

and having received an injury to the left forearm. Examination revealed marked bowing of the forearm; a diagnosis of greenstick fracture of both bones of the forearm was readily made, and confirmed later by roentgenoscopy. The callus was still soft enough so that the arm could be partially straightened, but there remained a certain amount of convexity of the posterior surface that tended to become more pronounced as soon as the corrective force ceased.

This seemed a suitable case for the application of elastic traction, and this was employed in the following manner:

A padded wooden splint reaching from the elbow to the palm was applied to the anterior surface of the forearm and held in position by adhesive plaster straps. A fairly thick gauze pad, about 1½ inches square and enclosing a bit of splint wood, was placed over the most prominent point on the back of the forearm, and a rubber band ¼ or ⅜ inch wide was slipped over the hand and arm so that it encircled the arm at the center of the gauze pad, and was held in position by a strip of adhesive plaster. The rubber band was under moderate tension, and caused no interference with the circulation below that point. A gauze bandage was applied so as to be snug but not compressive from the palm to the elbow. One mistake was made in the application of the rubber band which will be referred to in a moment. At the end of a week the bowing was found to have markedly decreased; but as the elastic band had been allowed to touch the skin at each border of the arm, the skin had been partially cut through at each of these situations. This is the mistake in technic referred to above, and was corrected in subsequent dressings in this and other cases by making the splint on the concave surface somewhat wider than the arm, and passing a broad strip of adhesive plaster rather loosely around the arm, over the splint and the gauze pad, which had been placed at the point of greatest convexity; the rubber band then being adjusted over this and held in position by short, vertically placed adhesive strips anteriorly and posteriorly.²

Since adopting this technic, I have had no excoriations of the arm. In the foregoing case, all traces of bowing had disappeared in less than three weeks; and since then I have used this device in several other cases of greenstick fracture of one or both bones, always with the same happy result. The results have been equally as good in cases of several weeks' standing as in those seen within a few days after the receipt of fracture, apparently the only difference being in the length of time the elastic traction has to be applied. Besides the simplicity of the method and perfection in results thus far obtained, another great advantage is that with proper technic the straightening process seems to be entirely painless. My experience with the method thus far (at least six cases) inclines me to the belief that if elastic traction is used from the outset in greenstick fractures of the forearm, it should rarely, if ever, be necessary to complete the fracture in order to insure a straight arm.

498 West End Avenue.

2. This case was presented before the Surgical Section of the New York Academy of Medicine, Dec. 7, 1917.

Health of the Average Citizen.—The first campaign of life extension work was conducted in Vance County. During six weeks about 400 persons were examined, one third of whom were women. Ninety-eight per cent. were found physically imperfect; 57 per cent. were in actual need of medical attention and were referred to physicians for treatment; 33 per cent. were unaware of any impairment, and some of these were carrying blood pressures of over 200, while a number showed signs of active tuberculosis and were still unaware of their condition.—North Carolina *Health Bulletin*, August, 1917.