Milk costs a trifle less than 7 cents per quart. Eggs vary from 50 to 20 cents, and are used accordingly. Butter costs on the average 28 cents. Flour has been \$5.50 to \$6.00 per barrel. The total cost of the experiment for extra service and food for the year has amounted to rather less than \$2,000. For this amount there have been given 5,900 days' treatment, making a cost of 33 cents per day for each patient.

In the beginning, when there were only 6 to 10 patients, the actual cost of the total hospital expenses was less than it had been during the preceding year when the hospital was first opened. This was due to economies that had been introduced during the year. This is only mentioned as it was a great encouragement to the managers to find that the hospital bills rather decreased than increased during the trial period of expansion.

In conclusion, all that remains to be said is that the House of the Good Samaritan has apparently made an experiment which can be adopted by many communities to assist them in solving their local tuberculosis problem. Many towns and cities have small hospitals whose beds cannot from the nature of things be used to care for the cases of tuberculosis of the town or city. In the smaller places practically all the physicians are interested in these hospitals and therefore can co-operate in having a large portion of tuberculous patients who come under their care congregate at the hospital. This real knowledge of the patients and their home surroundings by the physicians themselves is an advantage that the physician of the large city does not possess and for the most part has to learn second-hand through the eyes of his visiting nurse. It is perfectly possible for ways to be devised so that each patient shall return to his or her own physician for treatment or advice, or the work can be delegated to a visiting man, as may be deemed wisest. Those who support the hospital by their contributions can be educated to the need of such a day-sanatorium by lectures and the organization of a committee on tuberculosis and thus still greater interest in the hospital aroused in the community. Such patients as can should pay a small fee for their care at the hospital. It may be possible later either to get a special pavilion built for the care of the very advanced cases of tuberculosis or to get the city authorities to take action and provide beds to which the stigma of pauper is not attached for this much-deserving class of sufferers. To the community having a hospital in active operation that will attempt to follow this experiment we feel that more can be done to help the sufferers from phthisis and at a much less relative cost and trouble than by any other means yet suggested to fight tuberculosis.

MRS. RUSSELL SAGE has given \$125,000 to the Association for the Relief of Respectable Aged Indigent Females in the City of New York. The home of the Association, at 104th Street and Amsterdam Avenue, is being extensively enlarged, and when the addition is completed its capacity will be increased from 90 to 270 beds. — *Medical Record*.

ON NEUROLOGICAL AND PSYCHIATRIC DIAGNOSIS.*

BY LEWELLYS F. BARKER, M.D., BALTIMORE.

On taking up the subject allotted to me, "The Historical Development and Relative Value of Laboratory and Clinical Methods in Diagnosis, with Especial Reference to Neurological and Psychiatric Diagnosis," I must confess to have experienced some difficulty in deciding how to treat it. It was not entirely clear to me how sharply to separate clinical from laboratory methods.

If one means by a clinical method a procedure which is carried out at the bedside of the patient and by a laboratory method one which is applied in a room, building or workshop, especially fitted with suitable apparatus for conducting investigations in diagnosis, he is making a distinction where there is not always a difference, for the bed-room, at any rate in hospitals, is a room so fitted and is a laboratory. If by laboratory methods are meant those which cannot be applied at the bedside, then we have relatively few laboratory methods of diagnosis in neurology and psychiatry, though the recent development of biological reactions and complex metabolic studies give promise of more in the near future. Most physical, chemical and psychological methods of diagnosis can be used at the bedside, though it is not always convenient to use them there. Or if by laboratory methods we mean methods which are generally or more conveniently used in special rooms not occupied as the bed-room of the patient, then the field of laboratory diagnosis is wider, especially if instead of limiting the examinations in these rooms to the study of materials removed from the patient we take the patient himself there, as we often do, for the making of certain tests. But if the patient himself is removed to the laboratory for examination, the physician is at his side, and the method remains clinical. Thus it is obvious that bed-rooms are used as laboratories, and that laboratories are used for clinical work, and no sharp line can be drawn between the work and methods of the two places.

Nor is it feasible to distinguish clinical methods as methods of simple observation from laboratory methods as methods of experiment. For we make relatively few observations that are simple, unaided registrations of sense-impressions. On the contrary, the great mass of so-called clinical observations are observations under particular conditions modified at the will of the observer; that is to say, are experiments. Moreover, in all our clinical work — in the collection of facts, in the arranging of them, and in drawing inferences from them — the results of researches in laboratories are continually being utilized. Our observations, our arrangements of facts in sequence, and our conclusions are practically all based upon knowledge which at one time or another has been gained in special laboratories.

Thus while there are clinical methods in neu-

* Read before the Congress of American Physicians and Surgeons in Washington, May, 1907.

rology and psychiatry that are not laboratory methods, and there are laboratory methods which can only remotely be regarded as clinical, it seems to me that all the methods used in neurological and psychiatric diagnosis must be regarded as clinical methods whether they are applied at the bedside or in any one of many clinical laboratories. My task is therefore made easier and it will be permissible, perhaps, to devote all the time at my disposal to a brief consideration of the way in which neurological and psychiatric methods of diagnosis developed to their present status. No hard and fast line can be drawn between laboratory and clinical diagnosis.

The clinic is the mother of the medical laboratories, and they have one and all since their birth contributed to the parental support. The anatomical laboratory dates back three hundred years. The physiological and physiological-chemical laboratories, the pathological laboratory, the pharmacological laboratory and the hygienic laboratory were creations of the nineteenth century. The first general clinical laboratory proper for internal medicine was established by von Ziemssen a little over twenty years ago.¹ The facilities now offered in well-equipped laboratories in connection with hospitals, manned by trained observers, are of incalculable value, bettering as they do the diagnosis, the prognosis and the treatment for the patients, besides serving for the promotion of knowledge. The recent division of the research work of the general clinical laboratory into biological, physical and chemical sub-departments marks another era in medical-laboratory specialization. The foundation of the electro-diagnostic and electro-therapeutic laboratory was a landmark in the history of clinical neurology, and the establishment of psychopathic laboratories, beginning with that set up by Kraépelin (1894), promises to be of fundamental significance for the advance of psychiatric diagnosis.

The diagnosis of nervous and mental diseases made but slow progress until comparatively recent times. Mere clinical observation unaided could do but little until (1) laboratory studies had supplied some preliminary knowledge of the structure and functions of the nervous tissues; and (2) the growth of psychology as a science had yielded some insight into the workings of the normal mind. Physicians had from early times on recorded a number of symptom-complexes, and pathologists had observed certain of the grosser lesions in the central nervous system, but a knowledge of the relation of symptoms to lesions grew far more slowly in neurology than in other departments of internal medicine. The reasons are not far to seek.² The mere mechanical difficulty of opening the skull and spine was an impediment to neuropathology. Further, owing to the chronic course of most diseases, those who observed the early symptoms rarely followed the cases to their termination, and in homes for

the incurable and asylums where the late stages were passed through, there was too often lack of medical interest. The peculiar and complex structural organization of the nervous system was appalling to the majority of investigators. It was easier to study the pathology of diseases of the lung or liver, in which alterations in one area produced effects similar to those in another area of the same size, than to investigate the central nervous organs in which apparatus ministering to totally different functions may lie close together, perhaps only a few millimeters or a few centimeters apart, or in connection with which the disconcerting observation had been made that a lesion the size of a pin prick in one area can be of greater injury to the organism as a whole than the passage of a crowbar through another. In a whole series of diseases, manifestly of the nervous system, no anatomical changes were discoverable on thorough microscopic study of serial sections of the organs. It is but little wonder that the majority of physicians have preferred to work at problems which seemed easier to solve than those which the neurological and psychiatric inquirer is compelled to face.

Fortunately for the sciences of neurology and psychiatry, however, there have always been minds to which these problems have particularly appealed, and to which the difficulties, though great, did not appear insuperable. Romberg, inspired by Sir Charles Bell's great discovery of the sensory and motor nerves, and influenced by the more precise researches of Magendie, realized the value of applying physiological knowledge to the study of neuropathology and to neurological diagnosis; he gave modern clinical neurology a firm foundation by developing knowledge concerning disease of the peripheral nerves. In psychiatry, after Pinel had broken the chains in the Bicêtre, and John Conolly at Hanwell had promulgated the doctrine of "no restraint," a great step forward was taken when Griesinger made it clear that the science is a part of neuropathology and inseparable from it, and showed how necessary a thorough knowledge of the latter is for scientific work in the former. Griesinger's recognition of the defects in medical teaching of neural and mental phenomena and his demand not only for theoretical instruction, but for practical work by students in psychiatric clinics to be established at the universities, led first to the foundation of special clinics, and many years later to obligatory attendance and obligatory examinations in these subjects. These reforms gave an enormous impetus to the advance of both diagnosis and treatment in neurology and psychiatry.

Modern neurological diagnosis is a direct outgrowth of the physiological research undertaken on the nervous system at about the middle of the last century. The studies of the electrophysiology of muscles and nerves, the recognition of the spinal cord as an organ more or less independent of the rest of the nervous system, the inquiries into the functions of the organs of special sense and the relations of these to the higher psychic functions, the experimental investiga-

¹ Cf. Welch (W. H.): *The Evolution of Modern Scientific Laboratories*. Johns Hopkins Hosp. Bull., Balt., 1896, vii, pp. 19-24.

² Cf. Westphal (C.): *Psychiatrie und Psychiatrische Unterricht*, Berlin, 1880.

tions bearing upon the functions of the cerebral cortex — all were utilized for the extension of clinical methods of examination, and for the interpretations of clinical findings.³ Slow but sure progress was made also through the control of clinical studies by autopsies and the macroscopic and microscopic examinations of the brain and cord. Especial activity in such studies was shown by the clinico-pathological school at the Salpêtrière, of which Charcot was leader. English neurologists, notably Hughlings Jackson and Gowers, also made valuable contributions. These, with the clinical electrical studies of Duchenne, Remak and Erb, did much to increase the accuracy of diagnosis. The invention by Helmholtz of the ophthalmoscope permitted the direct observation of a part of the central nervous system (the papillæ of the optic nerves), a method of examination so important for differential diagnosis that every neurologist feels impelled to perfect himself in it. The study of the neuroses, especially after the introduction of the Weir Mitchell cure, helped to bridge the gap between neurology and psychiatry.

The laboratories of anatomy, physiology and pathology have afforded the data for the *diagnosis of the seat of lesions* and their nature. The localization has become more precise as these sciences have grown, passing from the gross terms cerebral, cerebellar, spinal and peripheral, through systemic, nuclear and segmental, to, more recently, the neuronal. Criteria for a *diagnosis of the nature of the lesion* have been drawn from pathological anatomy and physiology, and lastly progress has been making in the *diagnosis of the causes* of nervous diseases through advances in pathogenetic studies. Time will not permit even a sketch of the contributions to diagnosis made by the various laboratory subjects, but anatomy, physiology, pathology, anthropology, biology, chemistry, physics and pharmacology all have lent a hand. The nature of the infectious diseases which involve the nervous system — cerebrospinal meningitis, tuberculosis, syphilis, tetanus, influenza, leprosy, diphtheria — has been cleared up for us by bacteriological studies, and modern parasitology has revealed the mysteries of the coma of malaria and the sopor of African sleeping sickness. The clinical laboratories have applied the methods of chemistry, physics and biology and revealed to us the changes in the blood, the urine and the cerebrospinal fluid in nervous disease. New methods of examination are constantly being devised. Within a few months the workers in immunity problems have shown us how to demonstrate the presence of amboceptors for the syphilitic antigen in the cerebrospinal fluid of patients suffering from dementia paralytica. Each year we learn not only how to see, how to hear and how to feel more precisely, but actually to see, hear and feel things entirely new to us, to make observations of phenomena which all through preceding centuries have escaped detection by clinicians.

³ Cf. Erb (W.): Ueber die neuere Entwicklung der Nervenpathologie und ihre Bedeutung für den medicinischen Unterricht. Leipzig, 1880.

In searching for disturbances of motility, sensation, reflexes, nutrition, speech, intelligence, emotion or will, the tendency of modern neurology and psychiatry is to become ever more objective, to exclude as far as possible the subjectivity of the examiner in observation and record, for in this way only is it possible to obtain results which are comparable and which can be utilized for science. Hospital records strive now in describing what can be seen, felt or heard, to use words of pure description unmixed with judgments or inferences, though that they still fall far short of their aim, every one who has occasion to consult these records knows. To counteract the errors of omission and commission of description, other still more exact methods of scientific registration are being more and more employed. Thus optic methods of reproduction, photography (simple, stereoscopic and cinematographic) are helpful in both neurology and psychiatry, and various graphic methods of investigating motor disturbances are gradually finding a place. The phonograph has been utilized for the registration of phonetic expressions, and the analysis of phonetic processes by motor graphic methods has been begun.

Perhaps the greatest progress making at present lies in the improvement of methods of investigating the psychic states and processes in nervous and mental diseases. The examination of the psychic side of a patient, often more important than the somatic inquiry, should, it is now realized, be carried out just as systematically and objectively as the examination of the physical condition. Psychiatry has suffered seriously from subjectivity. Thanks especially to the transfer of the methods of psychophysics to psychopathology, data are gradually being accumulated which are independent of the accidental subject of the observer. The principle of the "uniform stimulus" and the principle of the "reaction-time" have been adopted in the clinical psychopathic laboratory with gratifying results.⁴ The testing of the perceptive faculty, the investigation of sense perceptions, the study of the orientation of the patient, the trial of memory, the examination of powers of work, and especially the inquiry into the characters of the associative processes, as conducted by the physician who has been well trained in the modern psychiatric clinic, permit of a precision and an extension to which the old clinical conversation could not attain. Though our knowledge of facts is as yet very incomplete, our comparable experiences with accurately studied material too small to permit of such reliable clinical formalizing in mental disorders, there can be no doubt that as we continue to observe what actually occurs in nature and to sift our observations empirically, separating as well as we can the essentials from the episodal in the disease-picture, we shall arrive at generalizations that will give us a diagnostic power in psychiatry equivalent to that we possess

⁴Cf. Kraepelin (E.): Der psychologische Versuch in der Psychiatrie. Psychol. Arb., Leipzig, 1896, I, pp. 1-91. Sommer R.): Lehrbuch der psychopathologischen Untersuchungs-Methoden (Berlin u. Wien, 1899.

in other branches of internal medicine.⁵ The certainty with which it is now possible to make the diagnosis and prognosis in dementia paralytica is an instance in point. Hallucinations, delusions and abnormal moods, it has been discovered, are less essential for diagnosis than are disturbances of orientation and of the perceptive faculty, motor states and flight of ideas. Single disturbances not pathognomonic in themselves assume diagnostic importance according to their special grouping, as, for instance, in the well-known example of the different relations of confusion, excitation and orientation in kakatonia, mania and amentia. The widening of the functions of the anamnesis in history-taking by Janet and the emphasis laid upon the katamnesis by Kraepelin, have markedly enriched our diagnostic data in psychasthenic states in the one instance and in processes which terminate in dementia in the other.

Among the more interesting features of contemporary psychiatric diagnosis is the attention which is being paid to the so-called psycho-analytic method, as practised by Freud,⁶ Riklin,⁷ Jung.⁸ Those who are working with Freud's method of investigating the psychology of daily life, of hysteria and of dreams are much impressed with the ingenious conceptions of that investigator and urge those who are skeptical not to condemn it on superficial examination or from prejudice due to Freud's over-emphasis of the rôle played by sexuality in the psyche. Some of the explanations which it is asserted the method affords almost remind one in brilliancy of the interpretation of the handwriting on Belshazzar's palace wall. The search for the hidden psychic complex, to which some painful emotion is attached, unbearable in conscienceness and accordingly suppressed, is proving to be a helpful idea in the study of psychiatric cases, Freud maintaining that the hallucinatory delirium may represent a compensation for unsatisfied desires, hinting that man sometimes resorts to a psychosis in order to find in its dreamy states that which is denied him in real life.

Further studies suggest that much light may be thrown upon paranoic states by assuming that they, like the mental states of the hysterical, proceed from the suppression of painful memories, and that other symptoms in dementia precox — the weakness of apperception, the perseverations, the tendency to symbolism, the stereotypism, the command-automatisms, the apathy, the aboulia and the negativism (to speak in the slang of the psychiatrists) — may be determined more or less by the suppressed complex. Such an explanation, however, in order to account for the stability and resistance of the paranoid dement, contrasted

with the mobility of the hysteric, has to assume a fixation of the affectivity in the one, possibly due to some metabolic intoxication (Jung), which is absent in the other.

A very great impetus would be given to neurological and psychiatric diagnosis in America if psychiatric clinics were to be established in connection with every great hospital or medical school. It is humiliating to think that this country, so far in advance in many other respects, is fifty years behind Germany, Italy and France in the recognition and satisfaction of this particular need. Since one in every three hundred inhabitants of this country is either insane or feeble-minded, and the estimated cost to this country of psychiatric disease is, according to Dana, \$85,000,000 annually, a cost which is increasing at the rate of 4%, the desirability of education in these matters is obvious enough. Half the money which was put into a temple recently reared by propagandists of a pseudo-scientific cult in Boston, in order to minister to certain psychic needs of some of the American people, would have been sufficient to build a first-class psychiatric clinic. The psychiatric clinics should come in America, and at once. Fifty years later is better than later! There can be no doubt that America will sooner or later lead in this, as she is doing in other sciences.

THE HISTORICAL DEVELOPMENT AND RELATIVE VALUE OF LABORATORY AND CLINICAL METHODS OF DIAGNOSIS.*

BY RICHARD C. CABOT, M.D., BOSTON.

PHYSICAL DIAGNOSIS.

I SINCERELY hope that this Congress and the year 1907 will mark an end of the false and harmful distinction expressed in the title of this address; the distinction, namely, between "laboratory" and "clinical" methods of diagnosis. My first reason for objecting to this distinction is that it is impossible of definition. No one doubts that we apply what are called *clinical* methods of diagnosis to the patients who consult us at our offices or in a hospital dispensary; yet in such cases nothing occurs "at the bedside," because the patient is not in bed. My second objection is that there are many methods which are carried out sometimes at the bedside and sometimes in the laboratory, the difference depending not upon anything inherent in the method employed, but wholly upon extraneous considerations. For example, an examination of fresh blood must be made at or near the bedside; while an examination of stained blood may be made either at the bedside or elsewhere.

It may be said that the distinction is a real one, though not coincident with the literal meaning of the words. It is often supposed that by *laboratory* methods of examination we mean the most *exact* instrumental methods, contrasting them with the *rougher* and more approximate processes used at the *bedside*. But this distinction is obvi-

*Read before the Congress of American Physicians and Surgeons in Washington, May, 1907.

⁵ Cf. Kraepelin (E.): Ziele und Wege der klinischen Psychiatrie. Allg. Zeitschr. für Psychiat., 1896-9, liii, p. 840. Wernicke (C.): Aufgaben der klinischen Psychiatrie. Breslauer wörtl. Zeitschr., 1887, p. 145.

⁶ Freud (S.): Die Traumdeutung, Leipz. u. Wien, 1900; Zur Psychopathologie des Alltagslebens. (Vergessen, Versprechen, Vergreifen), nebst Bemerkungen ueber eine Wurzel des Aberglaubens. Monatsh. für Psychiat. u. Neurol., 1901, x, pp. 1-95.

⁷ Riklin: Zur Psychologie hysterischer Dämmerzustände und des Ganser'schen Symptoms. Psychol.-neurol., Wochenschr., 1906.

⁸ Jung (C. G.): Diagnostische Assoziationsstudien Leipzig, 1906; Die Psychol. Diagnose des Tatbestanden, 1906; Ueber die Psychologie der Dementia Precox; Ein Versuch. Halle, 1907.