

HOSPITAL CLINICS AND MEDICAL PROGRESS.

THE PHYSIOLOGY OF SIMULTANEOUS AMBIDEXTRAL WORK.

A LECTURE on this subject was delivered last week before the Ambidextral Culture Society by the Secretary, Mr. John Jackson. The lecturer referred to the equal skill in rapid and complicated movements of the two hands, which is displayed by skilled pianists, as a familiar example of simultaneous ambidextral skill. Indeed, among ordinary individuals who have cultivated the use of only one hand there is, not merely a strong inclination to exercise both hands in totally different and unrelated duties which demand distinct and dissimilar movements at the same instant, but the exigencies of life and the imperative claims of certain occupations necessitate a very high standard of simultaneous skill, which standard there is no great difficulty in securing. But to the ambidextrous individual this synchronising development is natural and inevitable. The principles which it is the object of the Ambidextral Culture Society to maintain are:—(1) That it is possible to do two things well at the same time, and that every ordinarily intelligent person is capable of becoming as expert in the performance of two concurrent and unrelated acts as he can be in the separate accomplishment of one. (2) That the acts which are thus designated as concurrent or simultaneous are, so far as the senses can determine, absolutely so, whatever the refinement of analysis and science may ultimately declare them to be. For all practical purposes they occur precisely at the same instant, though they may theoretically be nothing more than inconceivably rapid alternations of volition. (3) That a certain amount of simultaneous work, under specified conditions, is healthy and expedient. (4) That under other particular conditions it is necessary and harmless. (5) That, whilst it is both proper and advantageous to prepare and qualify children for the execution of two-handed work, and more especially of two-handed writing, during their school life, it would be unwise, if not pernicious, to encourage or prescribe for artisans and others the least amount of simultaneous manual labour over and above what has hitherto been found requisite for the effective execution of the work to be done in the several industries of manufacturing life.

Sixty years ago Dr. A. L. Wigan published his monograph on "The Duality of the Mind," the expression of a belief 30 years old (the doctor himself was 60 when the book was published), which belief he says he had held all that time "with daily increasing conviction," and, further, he states that he "discussed the subject with more than a hundred of the first men in Europe," and that he "cannot remember a single objection made by a man of that stamp which has not vanished after my explanation." Among Dr. Wigan's 20 propositions are the following:—

"1. That each cerebrum is a distinct and perfect whole as an organ of thought.

"2. That a separate and distinct process of thinking or ratiocination may be carried on in each cerebrum simultaneously."

"3. That each cerebrum is capable of a distinct and separate volition, and that there are very often opposing volitions. . . .

"20. That every man is, in his own person, conscious of two volitions, quite distinct from the government of the passions by the intellect; a consciousness so universal that it enters into all figurative language on the moral feelings and sentiments, has enlisted into the service of every religion and forms the basis of some of them—as the Manichean."

In recent years Brown-Sequard and others have directed attention to the same question. The former states that "We have a great many motor elements in our brain which we neglect absolutely to educate. Such is the case particularly with the elements which serve for the movements of the left hand. Perhaps fathers and mothers will be more ready to develop the natural powers of the left hand of a child, giving it thereby two powerful hands, if they believe, as I do, that the condition of the brain and spinal cord would improve if all their motor and sensitive elements were fully exercised."

Apart from the opinions of individual authorities, corroborative evidence is to be found in familiar experience. How many clerks, for example, may be seen accurately casting up long rows of figures, while not merely conversing with another, but often telling an amusing tale with great rapidity, and this without an interruption or an interval of even a second of time in the narrative? In other pursuits similar evidence of concurrent mental processes can be adduced.

With regard to the question of whether the volitional impulses which govern the processes performed simultaneously by the two hands are really themselves simultaneous, or whether the "inconceivably rapid alternation" theory is correct, it is impossible to say, but the proposition is a correct one that these transmissions of will are progressing concurrently from two totally different and independent agencies, each of which is equal to its confrère in every particular so far as reason and the closest observation can see.

It is the aim and purpose of the Ambidextral Society to insure that every child at school shall be so drilled in both separate and simultaneous use of his two hands that whatever line of life he may enter he shall be fully prepared with two perfectly developed hands, equally sensitive, equally strong, and equally skilful. Such a scheme, whenever it is made an integral part of the national education, will undoubtedly raise the standard of excellence, and increase materially the effective working power of every individual, and of the community.

Illustrations of simultaneous ambidextral work were given on blackboards by Miss Daisy Jackson and several young ladies from the North Hackney

High School; the former drawing, at the request of one of the audience, a clock with the left hand, and the time indicated by the hands with the right hand, and the latter giving specimens of two-handed simultaneous drawing in duplicate.

BLACK URINE.

DR. GARROD¹ reminds us that one of the earliest recorded facts of clinical medicine is that urine is sometimes black. Both Hippocrates and Galen mention it as a symptom of fatal significance. Doubtless many of the cases mentioned in ancient books are instances of hæmaturia or hæmoglobinuria, or of urine rendered dark by bile pigment. He quotes from the pages of Zacutus Lusitanus (1649) the interesting case of a boy who had always passed black urine. In spite of the drastic measures adopted by his medical advisers to subdue the "fiery heat" of his internal organs, to which the phenomenon was attributed, the patient lived on for many years in good health, but still passing urine as black as ink. This case was probably an example of alkaptonuria, although there are some other rare conditions in which dark urine may be passed for many years or even throughout life.

Excluding cases of jaundice, hæmaturia, and hæmoglobinuria, urine which is black when excreted, or which becomes black subsequently, may be met with in hæmatoporphyrinuria, melanotic sarcoma, alkaptonuria, ochronosis, after the taking of certain drugs (*e.g.*, carbolic acid) or articles of diet, and in cases in which abundance of indican is present, in some cases of phthisis (only after the urine has been standing for some time), and in some other rare, undetermined conditions.

In the condition known as hæmatoporphyrinuria the urine may be black, but the dark colour is not due so much to the presence of hæmatoporphyrin as to other dark pigments which yield no characteristic spectra, and the nature of which is unknown. Most of the cases of hæmatoporphyrinuria recorded of recent years have been due to the taking of sulphonal or its allies (trional) over long periods, but occasionally the condition occurs apart from any drug administration, and one example has been reported of paroxysmal hæmatoporphyrinuria with symptoms like those of paroxysmal hæmoglobinuria. The recognition of such urines depends upon the observation of the spectroscopic absorption bands; as there is usually no albumen in the urine the presence of hæmoglobin can readily be excluded. Urine, whatever its reaction, never shows the spectrum of acid hæmatoporphyrin unless a mineral acid has been added to it.

True melanuria, associated with melanotic sarcoma, is rare. Dr. Garrod's observations are confirmatory of the following points:—In cases in which the growth is limited to its primary seat, or has not reached beyond the neighbouring lymphatic glands, melanogen (the chromogen of melanin) is not found in the urine. Only when the internal viscera have become involved does melanuria result, and the degree of melanuria appears to be proportional to the extent to which

the liver is involved, and to the quantity of pigment in the growths in that organ. He has never found melanuria in the absence of growths. Usually the urine is of normal colour when passed; but on standing exposed to the air it quickly becomes brown and then black, darkening taking place first at the surface and then spreading downwards. The addition of nitric acid to the cold urine at once produces blackness. Ferric chloride also causes immediate blackening, and a grey precipitate which forms is redissolved by excess of the reagent. This is the most delicate and distinctive test for the presence of melanogen.

In alkaptonuria, as in melanuria, the urine is normal in colour when fresh, but darkens, from the surface downward, on standing. The change occurs much more rapidly when an alkali is added, a reaction which has given the condition its name. Alkaptonuria is an extremely rare anomaly of proteid metabolism, usually congenital and lifelong, and one which appears to be harmless. Of the recorded cases a number have occurred in brothers and sisters; only two instances of direct transmission from parent to child are known, and a large proportion of the known alkaptonurics have been the offspring of consanguineous marriages. The condition appears to depend upon an incomplete destruction of certain products of proteid metabolism, namely, tyrosin and phenylalanin, which therefore, in an altered form (homogentisic acid), appear in the urine. The condition is recognised by the characters already described, and by the fact that the urine reduces Fehling's solution with the aid of heat, and ammoniacal silver nitrate solution in the cold. Hence the patient may be thought to suffer from diabetes.

Ochronosis is an extremely rare condition, no case having as yet been recorded in this country. It apparently has some affinities with alkaptonuria. Pigmentation occurs during life in the cartilages and some other tissues (*e.g.* conjunctiva).

Indicanuria, although among the commoner causes of dark urine, is, Dr. Garrod believes, not nearly so well recognised as it should be. In this condition the urine blackens when warmed with nitric acid, but there is no such immediate blackening in the cold as occurs in true melanuria. No blackening is caused by the addition of ferric chloride, by which test the presence of melanogen is excluded. A confirmatory test is afforded by heating the urine with hydrochloric acid and a drop of nitric acid, and shaking with chloroform, by which means the indigo pigments are readily extracted, although the supernatant liquid retains an inky blackness. Such urines do not reduce Fehling's solution. Conditions which lead to abundant secretion of indican are intestinal obstruction, excessive bacterial activity in the intestine, putrefactive changes in collections of pus.

It was observed by Hale White that in some cases of phthisis the urine, even if kept for weeks exposed to the air, remained acid, and sometimes became brown or black on long keeping. This phenomenon may be due to the increased excretion of