THE UPRIGHT POSITION IN MAN.

DR. GUY HINDSDALE of Philadelphia has carried out a suggestion of Dr. Weir Mitchell's to a very interesting conclusion (*Amer. journ. med. sc.*, April, 1887). The suggestion consisted in the desire to record accurately the swaying to and fro and from side to side which every one feels himself involuntarily making when trying to stand perfectly still. Placing the heels and toes together, with the hands hanging from the sides, the head erect, and the eyes directed to a fixed object, a silk thread was attached to the forehead, passed over a pulley, and was connected with a rod moving vertically and carrying an index. The index recorded on the smoked surface of a revolving drum. A fall of the line on the drum indicated a forward movement of the head, and an upward line a backward movement. The lateral movements of the head were similarly resolved into the downward and upward tracings of a second index. A third curve recorded the respiration, and a fourth marked seconds.

Another method of recording the sway consists in placing a flat piece of cardboard with a smoked surface upon the subject's head, and have him stand under an index free to move up and down in a fixed line. The resulting tracing shows the continuous movements which occurred. This method is coarser than the other, but has practical points of interest for clinical purposes to which it has already been applied.

Without exception, all persons, including the most healthy, swayed both forward and backward and from side to side. The first movement is generally the more extensive, and is, on the average, one inch, while the lateral sway averages about three-quarters of an inch in normal adults. The first movement is almost invariably forward, then a counterbalancing movement backward with a tendency towards the right. The rate of the movement shows a rhythmical tendency of about fourteen per minute, with a respiration of about twenty-two per minute. The significance of this rate has not yet been ascertained, and its constancy suffers many deviations.

An interesting observation is the common tendency of falling forwards and towards the *right*, which at once suggests all the problems of bilateral asymmetry. The suggestion is borne out by further trial; for, while right-handed people almost invariably are inclined to tilt over to the right, of twenty-two left-handed people, twelve inclined towards the left. This agrees well with the observations that the right arm is heavier and larger than the left, and thus brings the centre of gravity on the right side. That this is co-ordinated with an increased development of the left brain is well made out, and receives its final confirmation in the fact recorded by Flechsig, that more fibres cross over in the pyramidal decussation from the left brain to the right side than *vice versa*.

That the eyes are used to correct these swayings is well proved by the fact that, with the eyes closed, the sway is increased by about fifty per cent. So, also, absence of fixation of the eyes, reading aloud, removal of the shoes and stockings, materially increase the sway.

Children sway absolutely more than adults, and there is greater equality in their case between the antero-posterior and the lateral sway. Twenty-five girls showed an average lateral sway of 1.06 inches, and an antero-posterior sway of 1.08 inches, which was increased by about forty per cent when the eyes were closed.

Thirty-nine blind persons gave an average lateral deviation of 1.4 inches, and an antero-posterior deviation of 1.7 inches, which is about the same as that of seeing persons with closed eyes, thus suggesting that the years of experience have been of no avail in making the blind keep a truer equilibrium than seeing persons momentarily deprived of sight. In deaf-mutes the lateral sway was .93 of an inch, and the antero-posterior .85, which averages became 1.18 and 1.31 with closed eyes. All except two of these (all were right-handed) swayed towards the right. (Incidentally the observation of Professor James, that deaf-mutes are less liable to dizziness than normal persons, was confirmed.)

From the clinical side, it was found that ether exaggerates the normal sway considerably without introducing other peculiarities. In locomotor ataxia (characterized by unsteadiness and uncertainty of the gait) the sway with the eyes open in several cases was observed to vary from 2.25 to 3.75 inches on the antero-posterior line, and from 2.50 to 3.25 laterally. Six observations with the eyes shut show a lateral sway of from 3 to 6 inches, and an antero-posterior sway of from 3 to 7 inches. A case of spastic paralysis showed the deviations almost entirely in the antero-posterior line, while in chorea the difference between the deviations in the two directions is marked, and both are exaggerated (lateral, 1.45 inches; antero-posterior, 2.35 inches).

Dr. Hindsdale justly claims for these observations considerable suggestiveness for physiological research and direct clinical utility.

FLORIDA GEOLOGICAL SURVEY.

FOR the first time in the history of the state, Florida has instituted a geological survey of its territory. The survey is not yet fully organized; but a preliminary report of thirty-one pages, on

the geological features of the state, has been prepared by Dr. J. Kost. Florida has never been a very promising geological field, the rocks being effectually concealed almost everywhere over its level surface by extensive quaternary and recent deposits; while the facilities for geological observation afforded by artificial excavation and river and coast erosion are very meagre. Enough facts, however, have already been determined to show that Florida can no longer be regarded as simply a long stretch of sand deposited on a series of coral reefs. Every member of the tertiary series has been identified in the state, and the lowest division or eocene, especially, is of considerable extent and thickness. A low anticlinal axis runs down the peninsula midway between the east and west coasts. This uplift appears to have occurred at the close of the eocene, since the later rocks differ in character on the two sides of the ridge. Those of the east side are chiefly the coquina or shell limestone; while those of the west side are coralline and shelly limestone, and sandstone, with much siliceous material. In most parts of the state, all the formations, and especially those newer than the eocene, are often exceedingly cavernous; branching channels, with running streams into which numerous sink-holes descend from the surface, constituting an extensive system of subterranean drainage. In numerous instances these subterranean streams reach the surface at lower levels, forming springs of great size and force. Under the head of geological principles, the physical and geographical features of the state in the successive epochs, and the sources of the different kinds of sediment, are discussed at some length. The sandy and seemingly barren soil of Florida is shown, by statements concerning its composition and agricultural products, to possess virtues not suspected by the casual observer. Not only is the soil much better than it has been represented, but it is shown that the state is not lacking in materials for improving it to any desired extent. Shell marl is abundant in all parts of the state, and the discovery of important phosphate deposits similar to those of South Carolina is announced. Aside from the marls and phosphates, the mineral resources of Florida are very limited, including, however, some building-stones and clay-beds, and indications of lignite and iron ore.

MR. AND MRS. E. W. MORSE, pioneer members of the San Diego society of natural history, have recently presented that association with a lot near the post-office, valued at over twelve thousand dollars. By the conditions of the gift, the society will erect a building.

RELATION OF THE STATE TO INDUSTRIAL ACTION.

PROFESSOR ADAMS has given us a pamphlet that is not only critical but constructive, and it is the ablest monograph that the Economic association has yet issued. It is not altogether new, for its substance was read some time ago as a paper before the Constitution club of New York City, and published by the club with the title "Principles that should control the interference of the state in industries." In its present form, however, the argument is both revised and extended.

The author's plan of procedure is simple and suggestive. He first takes up the *laissez-faire* theory, analyzes it, and finds it inadequate as a guide in constructive economics, and then develops his own principles for the regulation and limitation of state interference. Professor Adams finds himself unable to follow Mill's dictum that every departure from *laissez-faire*, unless required by some great good, is a certain evil. He finds the presumption against state activity an insufficient principle upon which to base constructive efforts. He, moreover, regards the modification of the English system of economics for which Professor Cairnes is largely responsible as no improvement. "In its original form, it [English economics] was conclusive as as argument though based upon an erroneous premise; in its modernized form the error of its premise has been corrected, but its conclusiveness as an argument has thereby been destroyed" (p. 25). As modified, the doctrine of *laissez-faire* cannot lay claim to scientific pretension, and amounts to nothing more than a declaration in favor of the wisdom of conservatism.

In seeking to replace this now discarded principle, Professor Adams finds some obstacles, owing to the general failure to distinguish clearly between *laissez-faire* as a dogma and free competition as a principle. "The former is a rule or maxim intended for the guidance of public administration; the latter is a convenient expression for bringing to mind certain conditions of industrial society" (p. 32). Over against the prevailing English maxim with its presumption in favor of the individual, on the one hand, and against the prevailing German maxim with its presumption in favor of the state, on the other, the author brings forward this principle, distinct from both, as the starting-point for constructive study: "It should be the purpose of all laws touching matters of business, to maintain the beneficent results of competitive action while guarding society from

Relation of the state to industrial action. By HENRY C. ADAMS. Baltimore, American economic association. 8°.