

every thing useful. In addition to the attendance upon the prescribed gymnastic exercises, it is found that a large proportion of the students, of their own accord, make use of the facilities here afforded for the acquirement of a complete physical development, and the maintenance of good health.

Not among the least of the far-reaching results of the work of this department is the uniform series of vital statistics obtained from all students of the institution, and which consist of a permanent record of certain bodily measurements and tests of the vital organs made three times during the course of the student at college. Since the inception of the department, nearly three thousand different men have been measured on a systematic plan, and the results have already formed the basis of invaluable contributions to anthropometry. The accompanying illustration is reproduced from a photographic view of the north front of the gymnasium.

SCIENCE AND SURGERY: A TRIUMPHANT RESULT OF EXPERIMENTAL RESEARCH.¹

FROM the earliest ages, the functions of the brain have been a fascinating study to cultivated minds, and the greatest intellects of all ages have occupied themselves in attempting to solve its difficult and complicated problems. With the ancients this was a favorite pursuit, and engrossed the thoughts and talents of their most illustrious philosophers. Owing to the absence of exact methods of scientific observation and experiment, the conclusions on this subject were for many centuries of a purely speculative character, and the errors and fallacies thus deduced have been handed down and accepted till comparatively recent times.

Modern investigations have, however, thrown a flood of light on the question; and, although much still remains in the dark, the former obscurity has of late years been brightly illumined by the lamp of science. The accumulated clinical experience of ages had left knowledge on the cerebral functions in a state of confusion and uncertainty; and, owing to the obvious difficulties and complications associated with disease, the results, however significant, were at best imperfect. That the brain should be subjected to direct physiological experiment, was, until modern times, never attempted. During the last generation only, has the practicability of this been demonstrated; and numerous observers have, by direct operations on the brain-substance of animals, arrived at new conclusions as to its functions, and greatly revolutionized our ancient conceptions on the subject. Evidence has also been given against the *noli me tangere* theory, and abundant proof has been adduced of the fact that the brain may be handled, irritated, or partially destroyed, without necessary danger to life.

One of the latest developments of this method of investigation has been the discovery of those centres

in the cortex which preside over voluntary motion, which have been, more especially by Professor Ferrier, differentiated and localized with great precision. This important knowledge has been arrived at by an extended series of experiments conducted on living animals, in which, by observing the several effects of stimulating or destroying limited areas of their brains, the different functions of these special localities have been determined. A topography of the cerebrum has thus been constructed, in which the various faculties have been mapped out; but these, unlike the illogical visions of the phrenologists, have stood the test of sceptical criticism and rigid experimental inquiry.

Researches of a purely scientific nature, carried out only with the object of elucidating truth and advancing knowledge, without immediate prospects of material gain, have in this instance led to most important and useful practical advantage. Armed with the knowledge acquired on animals in the laboratory, the physician has been enabled to utilize at the bedside the conclusions thus arrived at for the service of human beings. Clinical experience, combined with morbid anatomy, had already enabled the medical man to suspect the presence of disease in the brain; but as to its precise locality he was formerly in doubt. Now, however, guided by the recent revelations of physiology, he is enabled to predict the position in a large number of cases with great certainty and precision.

Evidence of this is afforded by the proceeding adopted in a case of disease, notice of which has lately appeared in the medical papers. It appears that a man presented a series of symptoms which enabled Dr. Hughes Bennett to diagnose a tumor of the brain, that it involved its cortical substance, that it was probably of limited size, and that it was situated at a certain definite spot. The skull was trephined over the suspected region: there a tumor was found and removed. On recovering from the immediate effects of the operation, the patient was, and continued for three weeks, in a satisfactory condition. He was perfectly intelligent; his functions, except for certain defects of motion caused by the disease, were normally performed; and there was an absence of all the distressing symptoms from which he had formerly suffered, and from which he must necessarily soon have succumbed. Unfortunately, at the end of this time a complication incident to all serious surgical operations supervened, from which the patient ultimately died. The unhappy termination of this particular case does not in any way detract from the importance of the principles which it involves. It still remains a signal triumph of diagnostic accuracy, — a precision mainly attained by exact experimental research. It is, moreover, further proof, that, by utilizing this improved knowledge, the surgeon may not only remove disease from the brain, but may do so without necessary shock or risk to the nervous system; and that the procedure, under modern antiseptic precautions, need not be attended with greater danger than may follow any other severe surgical injury.

¹ Reprinted from *Nature* of Jan. 8.

This interesting and instructive case will doubtless inaugurate a new era in medical practice; for, although this particular individual has succumbed to measures adopted to avert his otherwise certain death, the experience thereby gained is sufficient to encourage further efforts in a similar direction, which may prove beneficial to others. In the Marshall Hall oration of last year, Professor Ferrier remarked, "There are already signs that we are within measurable distance of the successful treatment, by surgery, of some of the most distressing and otherwise hopeless forms of intercranial disease, which will vie with the splendid achievements of abdominal surgery." He further added, reflecting on the success which had attended brain operations on animals, "I can but believe that similar results are capable of being achieved on man himself." That distinguished physiologist can but feel gratified that his prophetic words have been partially realized.

DISCOVERY OF SILURIAN INSECTS.

SOME weeks since, we noticed the discovery by Lindström of a Silurian scorpion, *Palaeophoneus nuncius*, — the earliest-known air-breathing animal. To-day we reproduce in natural size a photograph of it received from Dr. Lindström. How quickly one discovery leads to another, is evinced by the curious fact that we now learn of the discovery by Dr. Hunter of another scorpion of the same genus in the Ludlow beds of Scotland, which are also referred to



PALAEOPHONEUS NUNCIUS.

the upper Silurian. This second specimen, fortunately, is preserved so as to show the stigmata and 'comb' of the ventral surface, and will therefore offer more evidence as to its exact zoological position. It is in the hands of Mr. Peach of the geological survey, who described the carboniferous scorpions of Scotland with such care. Even this curious discov-

ery is eclipsed by the announcement, at the last meeting of the French academy in 1884, of the finding of an insect's wing in the middle Silurian of Calvados, which Mr. Charles Brongniart, who announces the discovery, refers to a cockroach. It presents certain peculiarities, and among others an unusually long and straight anal vein. It is named *Palaeoblattina Douvillei*, after its discoverer. The oldest-known winged insects, up to this time, had been the Devonian insects of New Brunswick.

METEOROLOGICAL NOTES.

THE Colorado meteorological association, recently formed, proposes to establish stations for observation at twenty or more points in Colorado, and has applied to the legislature for assistance.

In co-operation with the chief signal-officer, U.S. army, arrangements have been completed with the Old colony railroad, whereby 'cold-wave' flags — white, with a black square in the centre — will be displayed at eleven of the most important stations on the road, on receipt of telegraphic orders from Washington. The stations are Boston, Quincy, South Braintree, Brockton, Middleborough, Taunton, Somerset, Fall River, Newport, New Bedford, and Plymouth. An extension of this arrangement is in contemplation, so as to bring the daily weather forecasts issued by the signal-office into even more general notice than they gain by publication in the daily papers.

Postmasters or town authorities in New England, desirous of undertaking the display of daily weather signals, are requested to address Mr. W. M. Davis, Cambridge, Mass.

Investigations upon the subject of ozone and the relation of its presence or absence to epidemic diseases are now carried on in various sections of the country. If sufficient encouragement is given, it is probable that observations will be undertaken by the New-England meteorological society, under the supervision of Dr. E. U. Jones of Taunton, Mass. Physicians and others who would be willing to engage in these observations are requested to address Dr. Jones. The cost will be about three dollars annually for each observer.

On the morning of Dec. 27, when the wind was everywhere light, the temperature at the summit of Mount Washington was $+16^{\circ}$, while at stations at lower levels, north of the Massachusetts boundary, the temperatures ranged from -10° to -24° .

A more striking instance of the disturbance of the usual law of decrease of temperature with increase of altitude is rarely noted.

In his 'Meteorological summary' for the year 1884, Prof. F. H. Snow states that the most notable features of the year 1884, in Kansas, were the low mean temperatures of the spring, summer, and win-