

in connection with so delicately balanced and complex an organism as is the human one, when the interference of the surgeon must cease or the vital equilibrium be overthrown; some organs must be forever free from the danger of the scalpel. We cannot, for instance, now imagine the discovery of any agent which can render possible any operation on the cardiac muscle, though to be sure similar ideas have prevailed till recently with regard to the brain substance, and are now quite mythical in the face of the conjoint operations of Gowers and Victor Horsley of London—while Lawson Tait's "scientific *hari-kari*" has only now ceased to be a marvel.

Recent advances in medicine, too, are touched upon in our article in a way which cannot fail to be interesting to the popular ear. Especially is the advancement in preventive medicine dwelt upon, and supported by the most encouraging statistics. Sir Lyon Playfair, for example, is quoted as follows:—

"The following figures give the deaths from disease for every hundred men lost in the campaign: French in the Crimean war, 79; United States troops in American war, 80; Germans in the late French war, 29."

Sanitary science must have advanced by leaps and bounds to reduce the average mortality from disease from 79 per 100 men in 1858 to 29 in 1870, twelve years only. Or, to quote again: "In the last century the climate of Calcutta was pestilential; it is stated that in 1723 a large proportion of the British residents of Fort William died of ague. Again, in this same city of Calcutta, Dr. Clark records that in 1770 an epidemic of ague occurred, which carried off 86,000 natives and 1,500 Englishmen." As proof of the results of careful drainage and other sanitary precautions, a medical authority is quoted as saying recently: "Strangers will read with surprise that I do not think I saw in Calcutta over a dozen cases of ague in a year on the average, and these occurred in persons who had gone into the neighboring jungles on hog-hunting and other such excursions"—a triumph indeed for modern science.

The two theories which have of late done most to advance medical science, are those with which the names of Sir Wm. Jenner and Pasteur are for all time to be associated. The principle of inoculation, which Jenner, as all the world knows, applied for the first time to the treatment of small-pox, is being rapidly extended as Koch, Virchow, Pasteur, Gaffky, and other of the fathers of the new science of Bacteriology, extend their researches. Correlated with the theory of inoculation is the germ, or microbe, theory of disease, not now a theory, but an established fact in reference to zymotic diseases, at any rate. Koch's name is in this connection perhaps most famous, as he first proved the existence of tubercular *bacillus*. The typhoid germ was isolated first by Gaffky so late only as 1886, and though in the first rush of acceptance of the new light the pendulum of medical opinion may be swinging too far, the discovery of the principle is of priceless importance in the elucidation of the causes of disease and of rational Therapeutics. One of the most interesting instances of the triumph of rational Therapeutics against empiric treatment, is the cure recently reported and explained by Lauder Brunton, of obsti-

nate constipation by opium in small doses, the very agent employed by the physician to check the opposite condition. The details of the case need not be mentioned, but the *rationale* of the cure was the relief by minute doses of opium of the ovarian irritation, which, acting reflexly on the nervous mechanism of the intestine, caused the constipation.

Then medicine owes much to advance in pathology, and the recent great improvements in the microscope; to such new remedies as the chemist and pharmacist are so frequently now discovering, and to the use of improved instruments of precision, such as the sphygmograph for ascertaining accurately the state of the pulse; the haemacytometer, by which the condition of the blood can be learned with scientific accuracy; the clinical thermometer, with its accompanying temperature-chart, so exceedingly helpful in the conduct of almost any case, whether medical or surgical; the urinometer, with its accompanying chemical tests, so absolutely essential now to the practitioner every day.

Improvements in pharmacy are almost countless. What the French call "elegant preparations" are now carefully prescribed, at least by the younger practitioner, and the hopelessly nasty concoctions of the last generation are becoming daily more rare. The Americans are the best pharmacists undoubtedly in the world, and the lists of pilules, tablets, tabloids, triturations, and so on, issued by firms like the Wyeths and Warners, are speedily replacing the bulky and nauseating preparations of twenty or thirty years ago, not only because the patient finds them more easily taken, but because the physician can prescribe with greater accuracy and certainty of result. How much more satisfactory both to the careful physician and his fastidious patient, to give minute doses of a carefully isolated alkaloid, instead of a bulky dose of the juice or tincture or crude drug containing it. Results are more certain, the physician may trust his patient to take his medicines when he is not present, and may avoid incompatibilities by ordering the antagonistic drugs to be taken at different periods, the patient now no longer dreading the dose recurring with every meal, but readily taking it even every two hours if need be. The necessity for the "shot-gun" prescription is thus in part gone.

Perhaps from chemistry medicine may hope for the greatest things. Perhaps the day may come—who knows?—so dreaded by Mr. Malthus, when population shall reach the limit of the earth's capacity to support. But it may be that by then some dusty *laborateur* may have mastered the process by which in nature's laboratory grass becomes milk, and may leave his odorous work-room to bless mankind with the food artificially prepared, which earth can then no longer yield in sufficient quantity. Mere fancy apart, the uses made by the chemist of late years of the waste products of so cheap and abundant a substance as coal tar, suggest almost infinite possibilities. Not dyes only of great beauty and brilliancy, but flavoring matters palatable and innoxious—even positively beneficial—for instance saccharine, said by Sir Henry Roscoe to be 250 to 300 times sweeter than ordinary cane sugar; the sufferer from diabetes, a form of dyspepsia in which sugar is forbidden, must thank the chemist for a substitute of