

to time, until the former reached forty pints and the latter thirty-two and two-tenths ounces in the twenty-four hours. From the very favorable reports of the effects of codeia in diabetes mellitus the foregoing articles were abandoned and the latter ordered in three-quarter-grain doses three times per day. In a week it was increased to one grain, and in ten days to one and one-half, and in two weeks to two grains t. d. At the end of third week the dose of codeia was reduced to one grain morning, noon, and night, as the amount of urine was nearly normal, the sugar had disappeared almost entirely, and the patient's thirst and dryness of skin had ceased to trouble him. His digestion had improved and his weight increased several pounds in the next fortnight, so that the dose of codeia was still further reduced to one-quarter grain t. d. During the treatment of the case a dose of mass. hydrarg. et ext. col. com., as at first, was given twice a week, and a tepid salt water bath, with the moderate use of the flesh-brush, resorted to once or twice per week until he was entirely well.

In the above typical cases two therapeutic agents stand forth as prominent factors,—viz., ergot in the insipid and codeia in the saccharine variety of diabetes. The effects of these agents, respectively, in the two forms of the disease, after the use of other remedies of recognized value had been productive of but little, if any, advantage, increase their claims to the consideration of the profession. Much credit is due to Prof. Da Costa for bringing ergot so clearly before the faculty. *Phil. Med. Times.*

THE GERM OF TUBERCULOSIS.

The organism of tubercle has hitherto eluded research. Its discovery is at last announced by the distinguished worker to whose investigations much of the progress of bacterial pathology has been due, Dr. Koch, who gave a description and demonstration of the organisms at a recent meeting of the Physiological Society of Berlin. It is only by means of a special method of preparation and examination that the objects can be detected. The method consists essentially in a process of coloring, which has been found necessary for the detection of these organisms, and in their examination under very strong illumination. But the details of the method have to be varied according to the tissue examined, whether a secretion, blood tissue fluid, or a section of an organ or tissue. If, for instance, it is desired to demonstrate the presence of the tubercle-bacilli in the fluid of the tissues, a thin layer of this is spread over a cover-glass. It is then dried and warmed for a few moments over a flame, so as to render it insoluble; it is then placed in a mixture of one cubic centimeter of a concentrated solution of methylene-blue in alcohol, two-tenths of a cubic centimeter of a

ten-per-cent solution of potash, and two hundred cubic centimeters of distilled water for twenty-four hours. The preparation is by this colored blue, and on it is then placed a few drops of a solution of vesuvin. This has the effect of discharging the methylene blue from all the tissue elements, but not from the bacilli. The former are of a brown color, and the blue bacilli are conspicuously defined. The preparation is then treated with absolute alcohol, oil of cloves, and Canada balsam, in the ordinary manner. This peculiarity of being rendered visible by the combined action of methylene blue and vesuvin is possessed only by the tubercle-bacilli and by those of leprosy. All other bacteria and micrococci known to Koch lose, under the action of vesuvin, the blue color which they acquire from methylene-blue.

The bacilli of tubercle, when rendered visible by this method of double coloration, are seen as very small rods, in length about one-third the diameter of a red blood corpuscle, and in breadth about one sixth of their length. In some of them distinct spores may be seen, as minute, unstained, refracting, vacuole-like structures, distinguishable, however, from the vacuoles in that at their position there is a slight fusiform enlargement of the bacillus. They are most abundant in recent tubercular neoplasms and least numerous in the caseating centre of old miliary tubercles. They are also visible within the giant cells, usually isolated, but sometimes forming well-marked sheaf-like bundles. Koch found the same organisms in the walls of tuberculous cavities, in the sputum of phthisical patients, in degenerated scrofulous glands, in fungous joints, and in the bones of tuberculous cattle. They were never absent in the tubercular new formations produced by inoculations, even in animals of the most different species.

In order to ascertain the all-important question whether these organisms are actually the *materies morbi* of tuberculosis, Koch has carried on an extensive series of culture-experiments, which have yielded the most striking results. As a culture-liquid, he employed sterilized blood-serum from the ox. The sterilization was effected in the method recommended by Tyndall, by placing the serum in a test-tube closed with a plug of wadding, and exposing it for an hour on each of several successive days to a temperature of 55° C. After this had been repeated for about six days, the temperature was raised to 65° C., and the previously fluid serum became transformed into a yellowish, translucent, but slightly opalescent, mass of the consistence of coagulated gelatine. Its translucency permitted the growth of organisms, either on its surface or in its depth, to be readily recognized by the resulting opacity. In order to increase the area of the free surface of this culture-soil, it is recommended to incline the test-tube at the moment of coagulation. A small fragment of excised tissue was introduced into a tube under special precautions to avoid contamination with