

hypertrophic form, of the lower part of the pectoralis major and the latissimus. In such primary muscular atrophies the distribution of the affection is strikingly different from that of those atrophies which depend on the nervous system—the muscles of the extremities, the hands and feet, suffer least. Abiotic degeneration may occur in the nervous system. Decay occurs first in those parts of the axis cylinder processes which are most remote from their cells of origin. The death of the nerve fibres, if in the central nervous system, is accompanied by an increase of the interstitial tissue—the neuroglia—so that for a long time the nature of the process was misunderstood. The spinal motor neurons may be affected, as in abiotic infantile atrophy, which commences about the end of the first year of life and causes almost universal paralysis and death at the end of the fifth or sixth year. The affection begins in the muscles of the hip and thigh and trunk, and thence extends, reaching last the extremities of the limbs—in this respect resembling abiotic muscular atrophy and differing from the ordinary form of spinal atrophy. An abiotic degeneration of the lateral pyramidal tracts, causing spastic paraplegia, is also met with in early adult life. The optic nerves frequently suffer from abiotic wasting. Many groups of cases are on record where several members of the same family have become blind, usually between the ages

of 15 and 25 years, from a slow wasting of the nerve fibres, progressive in spite of treatment. Friedrich's disease is a well-known form of abiotic atrophy, as is also the form sometimes known as heredo-cerebellar ataxy, but which is connected by many links to Friedrich's disease. In all these cases of abiotrophic affections of the nervous system in childhood or early adult life, the affection is generally a family one, and often hereditary. This "family" feature is clear proof of the congenital nature of the tendency to vital failure. The second group of degenerations due to premature vital failure occurs at the other end of life. The neurons which thus decay are the spinal motor neurons—causing either progressive muscular atrophy or labio-glossal paralysis. Mental change, especially simple mental failure, also often occurs under the same conditions, no doubt from a slow degeneration of cerebral neurons which connect and combine others. Another senile malady, paralysis agitans, must also be referred to vital failure in some cerebral motor structure. The commonest degenerations of middle life are tabes and general paralysis, but they are generally the result of some definite cause, and it is doubtful whether the underlying neuronc degenerations can be termed "abiotrophic."

¹ Med. News. ² Lancet, Feb. 8. ³ Lancet, June 14. ⁴ Lancet, April 12.

PROGRESS IN X-RAY THERAPEUTICS.

THAT malignant growths of the skin and of the subcutaneous structures do disappear under treatment with the X-rays there can be no doubt, as numerous reported cases undoubtedly show; but as to whether these disappearances are permanent and the patient really cured of the disease, time alone will show, for the records up to the present are of very recent date. As to how the rays act, according to Leslie Roberts¹ they have a two-fold action—firstly, one analogous to burning, and, secondly, a specific action. "They have a specific action on degenerative epithelium. The growth of hair, nails, and the horny cuticle were rapidly affected, and all these were forms of physiological degenerative epithelium. Rodent ulcer was a purely epithelial disease, and there could be no question that the rays caused a dissolution of the new epithelial cells. The same was true of epithelioma, and possibly to some extent of other forms of cancer. The remedial influence of the rays on lupus was to be attributed to their burning action, and not to any specific influence. No good effect resulted unless the exposure to the rays was followed by at least some symptoms of burning. . . . The X-rays were in the majority of cases inferior to the arc lamp in the treatment of lupus." W. J. Morton² suggests that "the analgesic action (of the X-rays) is due to the benumbing of the nerves of sensation. Equally and similarly the remaining nerve supply on the new growth must be benumbed. We have, therefore, a reduction in the force of the total innervation of the new growth. May it not be that this reduction of innervation results in a reduction in the activity of the growth of the part, and thus leads to a retrogression and cessation of its growth?" He further suggests "that the entire protoplasm of the part subjected to the radiation is to a greater or less extent be-

numbed in its activity," and he calls the process a "paresis or paralysis of the protoplasmic activity." He claims to have produced this "paralysis" in small jelly-fish as they moved about in a salt-water aquarium, by irradiating them with the X-ray.

Scirrhus.—Ferguson¹ reports a case in which a recurrent scirrhus growth of the size of a hen's egg disappeared "after twenty applications on as many days," but as there was "some deposit around the axillary vein" at the time of reporting the case, it is evident that the cure was not complete.

Carcinoma.—W. J. Morton, New York,² amongst other cases, gives four cases of carcinoma treated with the X-ray, in all of which he got great amelioration of symptoms. In one case, recurrent disease had implicated the whole of the left chest over the site of previous operations, and had also invaded the right breast. The effect of treatment was to relieve all the symptoms, and to cause "a marked diminution in size of the new growths, and an entire cessation of pain and suffering." In another case the growths in the breast and on the sternum were much reduced in size, and astonishing relief was given to agonising pain. In a third case, a hard and nodulated tumour of the breast, with an excrescent red growth, the tumour became "softer, more movable and smaller," and the red excrescent area "quite pale and brownish." In the fourth case there was a nodule in the breast the size of a pigeon's egg, hard, and apparently fixed to a rib. The result in this case was "impossible to feel any tumour; none exists, cured, except as to the usual possibility of a recurrence." A. B. Johnson³ mentions two cases of improvement under treatment: the first was that of a lady who had been twice operated on for cancer,

and had a recurrent growth "four inches long and three inches wide, firmly adherent to the ribs, together with several hundred secondary nodules scattered over the skin of the thorax, the upper part of the abdomen and the opposite breast. . . . Without burning this woman, the large growth had been made to practically disappear, the only trace now remaining of the large mass being an area resembling that seen after skin-grafting." The second case was one of carcinoma of the jaw, involving nearly all of the ramus of the jaw. After five-and-twenty applications of the X-rays, "the size of the tumour and of the surrounding soft parts was much less, and the neighbouring lymphatics had diminished in size. The

general health had decidedly improved, and from some of the sinuses which still remained open there was a discharge of what appeared to be broken-down carcinoma." T. Bryant of Guy's⁴ at a meeting of the South-West London Medical Society gave an account of some cases treated with the X-rays, and amongst them were two cases of recurrent cancer which had derived great benefit from the treatment. He thinks that "we must not yet talk of cancer cures, though we seem justified in saying the X-rays will kill pain and retard growth."

¹ Brit. Med. Journ., Feb. 1, 1902. ² Med. Rec., Mar. 8, 1902. ³ Med. Rec., Mar. 15, 1902. ⁴ Brit. Med. Journ., Dec. 7, 1901.

(To be continued.)

PROGRESS IN FEVERS.

Plague.—The Report of the Indian Plague Commission, of which Professor S. R. Fraser, of Edinburgh was President, and which included Professor Wright, of Netley, consists of several large foolscap volumes. Of these Vol. V., the Final Report, is the most important. It contains seven chapters and five appendices.¹ Chapter I. contains chiefly formal matter. Chapter IV. was published in February 1900. It deals with Haffkine's anti-plague inoculation.² Chapter II. gives an account of plague in India from 1896. The disease, practically unknown in the country for 60 years, was introduced into Bombay, obscurely, but probably by sea, in July 1896, and has chiefly affected the presidency of Bombay, showing a yearly decline and increase from 1896 to 1899, the period chiefly covered by the Report. Disinfection, isolation, removal to hospitals and camps, were practised as vigorously as possible. So extensive was the exodus of the inhabitants that in Bombay City a normal population of 846,000 fell to 450,000 in February 1897. In 1898 segregation of contacts was partially practised. During March 5,000 deaths from plague occurred, whilst only 200 deaths were reported in June, and a similar decline in June was noticed next year. Altogether 41,000 deaths from plague were reported, and probably 30,000 more actually occurred in Bombay between January 1897 and June 1899. Plague raged to a less extent in other parts also—in Mysore, Bengal, Madras Presidency and the Punjab and North-Western Provinces. Chapter III. deals with the characters of plague and the agents by which infection is spread. An appendix on the clinical features and treatment is supplied by the President, who, considering the serumtherapy of plague, remarks: "On the reasonable supposition that in bubonic cases the plague bacilli are for a time concentrated in the primary buboes, it is advisable to inject the serum into the buboes or the tissues immediately surrounding them, and it is probable that the best results will be obtained by this plan of administration, which, however, does not appear as yet to have been employed in practice." In an "average case" the incubation period was found to be well within five days. Pneumonic plague is classed as "highly infectious," but the infectivity of plague by personal contact under conditions of good ventilation and hygiene, such as obtain in a well-managed hospital, is considered small. Summing up concerning the infectivity of plague, the com-

missioners decide that the bubonic form is only dangerous through the excretions and in the last stages, that the primary pneumonic form is highly infective, that houses inhabited by plague patients or by plague-stricken rats and soiled fomites are infective, and that living in an infected house is far more dangerous than contact with a plague patient. Plague is a "disease of locality." The commissioners are guarded in their views regarding rats. They think the chief importance to be attached to their agency is the carrying of the disease to a hitherto unaffected place—"in many instances . . . they scatter plague broadcast over an uninfected place." Evidence was given showing that a month or two may elapse between the importation of infection and the outbreak of the disease. During this interval the commissioners think infection persists in soil or clothes rather than among rats. Professor Fraser thinks plague "cannot justly be regarded as a filth disease in the ordinary acceptance of the term," but the moisture and warmth required by its bacillus are found in unventilated rooms. Serum therapeutics are reviewed in Chapter V. The commissioners found Yersin's serum innocuous to guinea-pigs, they therefore used it for some hospital patients, but without striking success. Case mortality showed a diminution of not more than 4 or 5 per cent. Lustig's serum, which was found to accelerate death in guinea-pigs, was not employed. Several independent observers, however, reported diminished case mortality in patients treated with serum. The German and Russian plague commissions both found the serum harmless but useless. The Indian commissioners' own experiments were on a small scale and unsatisfactory. In Chapter VI are detailed the methods adopted for obtaining information of plague cases, such as notification, house-to-house visitation, corpse inspection, etc., and also the measures employed to check the spread of the disease, such as removal to hospitals, segregation of contacts, evacuation and disinfection—chemical and by means of admitting sunlight and air. The President regards free ventilation as of great importance, but the majority of the commissioners consider diffused daylight has no efficacy as a disinfectant. Most of these measures met with more or less opposition among the people. The commissioners hold that "if every case of plague could be isolated at once, and if the personal effects, clothes, and house of a patient were disinfected, and, further, if all plague-infected rats