in the North of England, no fewer than 515 of the highest monthly figure of 675 in January, 1926, having been reported for Durham and West Yorkshire. Possibly the lower winter temperature and absolute humidity in the North may be one factor in this distribution. The data are not yet sufficient to afford scope for forecasting the probable incidence some months ahead, as in India, but it may be significant that the less marked summer decline in 1924 than in 1923 was associated with lower summer absolute humidity in 1924, as I should expect a cool summer to produce less reduction of the disease, and a cold winter and spring should favour an increase.

The immediate outlook is complicated by four counties reporting cases at the end of January, 1928, against nine at the same period in 1927, but against this is the fact that the great rise early in 1927 was largely due to small-pox getting out of control in Durham, with nearly half the total January cases in that one county, which is not the case this year. The recent very mild January and early February is unfavourable to the rapid increase of the disease, as the period of the maximum occurring as late as April in two years with especially low spring absolute humidity, is too early to say whether the high small-pox rate of last year will be exceeded this year or not, but a cold spring is likely to result in some increase on the 1927 figures in future years of neglected vaccination and we are likely to possess better data for forecasting the epidemics here, as in India.

Nor should we forget that the present widespread mild small-pox is a reliable measure of what is likely to happen when the fatal African and Indian form once more gets a firm footing in the country. Thus early in 1924, as it nearly did in May, 1927, with five deaths among eleven cases in London, when a serious disaster was only stayed off by the fine team work of the medical profession in tracing and vaccinating contacts.

**Conclusion.**

The mild type of small-pox now endemic in England and Wales has increased each year for the past four seasons at an average rate of 160 per cent. on the previous year. Its seasonal prevalence is closely related to the absolute humidity, as I have previously shown to be the case in India. The absolute humidity favours and high checks the disease, and in this country the mean temperature curve closely follows the absolute humidity one, although this is not the case in India, where the yearly epidemics can be forecast several months ahead. In England the probable course can only be forecast at present for the succeeding month. A cold winter and spring are likely to result in increased small-pox.

Early in the investigations it was observed that the general symptoms complained of were coldness in the extremities, headache, depression, gastric disturbances, shooting pains, twitchings in the limbs, and staggering gait. It was further observed that the patients who complained of these symptoms were Jews and later that these Jews ate rye bread. On the other hand, those who had the symptoms complained of were observed among that portion of the Jewish population who ate white bread. It was then suggested that the rye bread might be the source of the trouble. From this it was concluded that the symptoms were due to ergot, which, as is well known, readily contaminates the rye grain before it is made into flour. It was pointed out that the symptoms were more pronounced in the Russian, Polish, and German-born Jews than in English-born Jews. This is explained by the fact that black bread is the bread commonly used on the Continent, whereas in this country its place is taken by white bread. Further, on account of the central habit of taste the black bread proves more palatable than the comparatively tasteless white bread. In addition to this, black bread is found to be more satisfying and is a little cheaper than white bread.

In some households it is found that one member may show symptoms while all the other members of the family are variously affected. Questions elicit the information that the unaffected member does not eat rye bread. In many of the cases first seen rye bread was stopped as an article of diet; this was followed by an early diminution in the symptoms, and a complete disappearance after a few weeks.

Rye is by far the most susceptible grain to infection by the parasitic fungus *Claviceps purpurea*. The grain is infected just as the flowers are opening, and the fungus enters at the end of the grain. The infection is only possible at this time, as the sheath later becomes too hard to penetrate. This most commonly occurs during a spell of sunshine following a cold, damp period, and the fungus can more readily be detected and demonstrated after a cold, damp raising and harvesting season—for example, that of autumn, 1927. Grain that is infected with ergot is seen to be black in colour, and when the central habit of taste the black bread proves more palatable than the comparatively tasteless white bread. It is probable that some signs of rye grain are ergotized and some are free from the infection.

In the ordinary course of events precautions are taken to prevent infected grain from passing to the consumer. This is accomplished by a process known as "screening," whereby the grain is passed through a sieve and the large infected grains are eliminated. If a sufficient proportion of infection is demonstrated in this manner, then the rye so contaminated is classified as unfit for use. This method of detection, however, is inefficient, as it does not prevent the small infected grains from passing through. Thus all the small infected grains are passed on as fit for use. All infected rye grain eventually becomes black in colour. It is therefore easy to identify with the naked eye. The grain is then ground and, after passing through the hands of various中间者, is bought by the baker for bread-making.

Rye flour has very poor keeping qualities, and therefore, as far as possible, it is only ground to meet consumption. Old rye is the best for use; freshly ground rye deteriorates in twelve hours, when it gives off a peculiar fishy odour. When this is smelt the baker invariably takes it as an indication that the flour must be used up quickly; otherwise it will be unfit for use. The rye used is home-ground when available, although lately a large percentage has been imported from Canada. In the baking warm water is added to the rye, and it is then allowed to "sour"; this takes about twelve hours. The list of which may be eighteen hours old before baking. The bakers get twice the wage of ordinary bakers, and no machinery is used in the process.

Samples of the grain, rye flour, rye meal, and the bread were submitted to Mr. H. Heap, the Manchester city analyst, who reported that the grain submitted showed 1 per cent. of ergotized rye.

On cutting sections of the infected grain the fungus...
Claviceps purpurea was at once seen invading it, and the fungus showed up well after staining with methylene blue and eosin. Sections of grain were also stained with iodine and potassium iodide for starch, none of which was seen in many sections, winter wheat having been replaced by the fungus. Extracts from the rye were also tested physiologically for ergot, and the results were positive. Mr. Heap has, moreover, been able to grow the fungus from the rye.

The three chief constituents of ergot are sphephelinic acid, cornitine, and ergotine. However, ergot is not as yet definitely split up into its component parts or active constituents, and little is at present known of them specifically.

It is found that the average Jewish person consumes about 1/2 lb. of rye bread per diem, the flour of which contains 1 per cent. of ergot. Now 1 1/2 lb. of bread will contain about 5 to 6 oz. of flour, the rest being the water, which is added before baking; 5 oz. of flour equals 2,285 grains, of which 1 per cent. is ergotized. Each person is thus consuming 22.85 grains of ergot daily. The ordinary medicinal dose of ergot, taking the liquid extract of ergot as a sample dose, is 10 to 20 minims, which equals 10 to 30 grains. Thus each individual is taking rather more than the average dose of ergot each day. On account of freshness the ergot is also likely to be more potent than that which has lain except for a grain harvested during last autumn, if infected by ergot, is likely to contain fresher principles than that of the ergot from the previous harvest. It is found that rye bread takes time to rise before baking, especially in the winter months, when it is colder; and the flour mixed with water is allowed to stand for a time to " sour," during which time it is likely that the fungus may increase in quantity.

The symptoms observed in these Jewish patients correspond very closely with those produced by chronic ergot poisoning. The severity of the symptoms varies from individual to individual, children being slightly and elderly persons more acutely affected. This may be due to the elderly people as a result of the bread taken for many years. The foreign-born Jews, who have always eaten rye bread, are the most affected.

The first symptoms observed are coldness of the extremities combined with numbness. These symptoms are especially observed in tailors, buttonholers, etc., who find that their fingers are numb and that they have difficulty in keeping up with their work. They often notice that they put on weight without feeling it. Raynaud's disease amongst the Jews during the winter would appear to be more prevalent than heretofore. We have also come across a man, aged 47, who has a definite dry gangrene of both hands. The gangrene of this man is not associated with diabetes or any similar condition, and it is possible that, even before the American invasion, his gangrene is due to ergot poisoning.

A very typical symptom, which is found in all marked cases, is that of an insect creeping under or over the skin. This symptom is volunteered by the patients in most cases. Itching is also a common symptom. They also suffer from nervousness and depression, whilst, his hands are well marked. Pains in the abdomen are frequently complained of, whilst among the more severe cases staggering gait and ataxia may be found. In most of the long-standing cases the blood pressure is definitely raised—for example, a woman aged 44 had a systolic blood pressure of 174. It has been observed that these cases quickly improve when rye bread as an article of diet is discontinued.

A large number of the symptoms are due to general contraction of the arteries all over the body, and it is probable that if the poisoning should become more severe such serious conditions as Raynaud's disease and gangrene will become more frequent. Ergot has the power of contracting the pregnant uterus, and it is likely that chronic ergot poisoning may cause many abortions in early pregnancy. Unfortunately no record is available of these cases as the Notification of Births Act only applies to children born after the expiration of the twenty-eighth week of pregnancy.

Treatment consists in stopping the consumption of the contaminated bread at once, and it is remarkable how quickly patients recover when this is done. They should be kept warm, and drug treatment is necessarily only partial to its effectiveness.

We are much indebted to Mr. H. Heap, M.Sc., F.I.C., the city analyst, for his careful analysis of the samples sent, and for his help and advice.

**THE INFLUENCE OF PARTURITION UPON INSANITY AND CRIME.**

**ABSTRACT OF A PAPER READ BEFORE THE MEDICO-LEGAL SOCIETY ON FEBRUARY 23RD, 1928.**

by A. LOUISE MCILROY, M.D., D.Sc., PROFESSOR OF OBSTETRICS AND GYNAECOLOGY, UNIVERSITY OF LONDON (ROYAL FREE HOSPITAL).

In 1922 the Infanticide Act relieved the courts from the painful task of finding a verdict of murder against a woman, mentally deranged by childbirth, who kills her newborn child.

The records of Broadmoor show that of the total female receptions from 1900 to 1924, 42.8 per cent. were in respect of child murders due to insanity associated with childbirth, the majority being crimes committed during lactation. To escape punishment a woman pleading puerperal insanity must prove (a) that she was insane at the time when she committed the offence; (b) that she was incapable of distinguishing right from wrong, or was under the influence of a delusion which prevented her from understanding at the moment the nature of the act which she was about to commit. The law assumes the delusion to be a fact, and if the fact would justify the act of violence then the prisoner would be entitled to a verdict of "guilty, but insane." This is provided for by the Criminal Lunatics Act, 1884. As many critics have pointed out, it is difficult to see how a woman can be both insane and guilty. Before the Infanticide Act a conviction for child murder was followed by a sentence of penal servitude, but under the act the act is followed by a sentence of infanticide, or, if the mother was insane, an order to be a nutrice for her child, and if insane, an order to be kept in an asylum. Before the act a woman who had killed her child would be sentenced to penal servitude, but under the act a woman who had killed her child would be sentenced to care of the state. Before the act a woman who had killed her child would be sentenced to penal servitude, but under the act a woman who had killed her child would be sentenced to care of the state.

The Infanticide Act provides (Section I):

"Where a woman by any wilful act or omission causes the death of her newly born child, but at the time of the act or omission is not of sound mind by reason of childbirth, she shall be deemed to have done the act for the purpose of injuring the child, and to be guilty of felony, to wit, infanticide, and may for such offence be dealt with and punished as if she had been guilty of the offence of manslaughter of such child."

As a corollary, Section II entitles a jury to find a verdict of infanticide where the charge is one of murder. To put the matter in a nutshell, in respect of a newly born child the mother has a period of absolution under the Act. When this period has expired, the defence of childbirth is on the same principles as other persons charged with murder. It is obvious that the Act requires two things—the woman must be mentally unbalanced and the child must be newly born. The absence from the Act of any definition of the term "newly born" has occasioned some discussion.

In a case relating to a young woman named Mary Donoghue, heard last November (1927), the Court of

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