

by 0·778, and that of auto-corrections by 0·060, whilst the percentage of children who did not make mistakes diminished by 15·03. The average of mistakes for every boy went from 2·19 to 4·64. Between the results obtained in 1900 and those obtained in 1905 there are differences which required to be analysed. In the year 1900 the percentage of mistakes was 0·257 higher than in 1905, whilst the percentage of the auto-corrections was a little smaller. The percentage of boys who did not make mistakes after two hours of lessons was higher in the year 1905 than in 1900, but was higher in relation to those who did not make mistakes at the beginning of the afternoon lessons than to those who made mistakes at the end of the afternoon lessons. In the year 1905 the difference in the percentage between the results obtained at 2 P.M. and those obtained at 3.30 P.M. was 30·6, whilst after the same period of time in the year 1900 it was only 15·03. The average of mistakes for every boy was higher in the year 1900 than in the year 1905, but it was higher also at the beginning of the afternoon lessons immediately after the midday rest and therefore the difference, although great, is less than appears at first sight. From this it may be concluded that the work done by the boys during the afternoon lessons was in 1905 a little better than in 1900, although also in 1905 after only a quarter of an hour's work a great number of mistakes were found.

TABLE III.—*Girls' Schools: General Summary of Results of the Year 1905.*

Trial.	Hours (P.M.).	Average age.	Written letters.	Mis-takes.		Differences.	Auto-cor-rections.		Girls who did not make mis-takes.		Average of mistakes for every girl.	Below the average	
				Total.	Per cent.		Total.	Per cent.	Total.	Per cent.		Total.	Per cent.
1	2	11 years and 8 months.	55,614	177	0·318	—	36	0·064	78	41·9	0·95	78	41·9
2	2½		54,112	349	0·644	+0·326	46	0·085	46	25·8	1·96	83	46·6
3	3½		58,865	434	0·737	+0·093	73	0·124	41	21·2	2·249	129	66·8

Girls.—Table III., which summarises the results obtained in the girls' schools in 1905, shows that after three-quarters of an hour of lessons—namely, at 2.45 P.M.—the girls made a number of mistakes higher than at 2 P.M., corresponding to a percentage of 0·322. The percentage of the auto-corrections went from 0·064 at 2 P.M. to 0·085 at 2.45 P.M. The percentage of girls who did not make mistakes was 16·1 less at 2.45 P.M. than it was at 2 P.M. At 3.30 P.M. the percentage of mistakes was higher by only 0·093 and that of the auto-corrections by 0·039, whilst that of the girls who did not make mistakes diminished by 4·6. Therefore it results that from 2 P.M. to 3.30 P.M. the percentage of mistakes augmented by 0·419 and that of the auto-corrections by 0·060, whilst that of the girls who did not make mistakes diminished by 20·7. The average of mistakes for every girl went from 0·95 to 2·24.

TABLE IV.—*Girls' Schools: General Summary of Results of the Year 1900.*

Trial.	Hours (P.M.).	Average age.	Written letters.	Mis-takes.		Differences.	Auto-cor-rections.		Girls who did not make mis-takes.		Average of mistakes for every girl.	Below the average	
				Total.	Per cent.		Total.	Per cent.	Total.	Per cent.		Total.	Per cent.
5	12½	11 years and 8 months.	36,300	108	0·297	—	26	0·071	58	50·87	0·94	71	62·50
6	2½		37,453	266	0·710	+0·413	46	0·122	23	18·40	2·12	82	65·60

The results obtained in the year 1900 and set out in Table IV. show that during two hours of lessons the percentage of mistakes augmented by 0·413 and that of the

auto corrections by 0·051, whilst that of the girls who did not make mistakes diminished by 32·47. The average of mistakes for every girl augmented by 1·18. The differences between these two trials are so little that one can conclude that the results obtained from the girls were identical in the year 1905 and in the year 1900.

From the two tables which summarise the results obtained in 1905 it will appear that in respect of quality there is very little difference between the children's school work done at 2.45 P.M. and at 3.30 P.M., but that, on the other hand, there are great differences between the school work done at 2 P.M. and at 2.45 P.M. The fact that the quality of the school work is almost the same at 2.45 P.M. and at 3.30 P.M. proves that after three-quarters of an hour of afternoon lessons (even if there is a two hours' interval between the forenoon and afternoon classes) the children are so tired that their work is full of mistakes and becomes only a little worse after another hour of lessons. As the results obtained in the boys' schools and in the girls' schools were identical, it may be said with certainty—as I have already mentioned in my observations on mental fatigue—that although the children are after the mid-day rest in a condition of mind capable of accomplishing the best work of the day, nevertheless they cannot support three-quarters of an hour of mental application without betraying mental fatigue. Again, the results obtained in the year 1905, when there was a rest of two hours between the morning and the afternoon lessons, are almost identical with those obtained in the year 1900 when this rest was only of three-quarters of an hour's duration. It is therefore obvious that the first method of teaching presents no real advantages over the last one.

The conclusions at which I arrived in the year 1900 are accordingly confirmed by these later researches and I feel myself entitled to repeat with more certainty than ever the following words with which I closed my book upon mental fatigue in school children: "The work done by the children during the afternoon lessons is, on account of the great mental fatigue that it involves, of no advantage to their instruction but is full of danger to their health."

Bologna, Italy.

A CASE OF GLANDERS.

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A MAN, aged 37 years, a porter in the meat market, was admitted into the Royal Free Hospital on Jan. 5th, 1903, under the care of Mr. James Berry, to whose kindness I am indebted for permission to publish this case. The illness apparently began on Dec. 1st, 1902, with a slight attack of pleurisy, which lasted ten days, after which the patient resumed work. While out walking, however, on Dec. 16th he was seized with severe pain in the left leg and for the next three weeks was treated and sent into hospital as a case of acute rheumatism.

On admission the temperature was 102·4° F., the pulse was 96, and the respirations were 26. There was no swelling or inflammation of the hip or leg, but much pain on movement of the thigh; there was tenderness in the region of the hip-joint and down the back of the leg, especially behind the knee; the leg was easiest in the position of semi-flexion. On Jan. 14th severe pain was felt in the right arm and the elbow-joint became swollen; definite swellings also appeared above and below the joint in the subcutaneous and muscular tissues extending half-way up the arm and a quarter the way down the forearm. The skin was reddened and pitted deeply on pressure and the condition resembled that of cellulitis. Some crepitations were heard over the lungs. The temperature ranged from 102° to 104° and the patient was obviously very ill. The case was now regarded as one of septicæmia. The left ankle and right knee-joint became successively swollen and painful. On the 19th, five days before death, pustules appeared on the right arm over the swollen areas; these were discrete at first, with hard indurated base, varying in size from that of a pin's head to that of a split pea; later these became confluent, breaking down to form serpiginous ulcers. On the 20th a swelling appeared on the left cheek, which fluctuated, and the left eyelids became

œdematous and closed. On the 22nd the swelling extended to the right side of the nose. On the 23rd pustules appeared on the left cheek, then on the right leg, chest, and left forearm, till they gradually spread over the whole body. An ulcer appeared inside the left nostril discharging greyish-brown pus. There was no albuminuria throughout the illness. The patient was now semi-comatose and became unconscious 24 hours before death. The temperature ran up to 107° just before death which took place at midnight on the 24th. On the 23rd a culture was made from the blood and some fluid was withdrawn from the right knee-joint.

Necropsy.—The face, right arm, and both legs were much swollen, the skin pitting on pressure. There were swellings and pustules as described above. The cheek muscles were infiltrated with pus; the mucous membrane of the mouth was very sloughy; there were no nodules on the hard palate. As regards the middle ear there was no pus in either cavity; the maxillary antrum (left side) contained yellow glairy pus (like that in the right knee-joint) and the mucous membrane was studded with a few small yellow nodules resembling tubercles. On the ala of the left nostril there was an unhealthy-looking ulcer exuding greyish-brown pus but the nasal septum was hyperæmic only and showed no nodules and no ulceration. The meninges and the brain were normal. The mucous membrane of the neck, the trachea, and the larynx was studded with minute grey and larger yellow nodules, there being no ulceration, while that of the upper part of the œsophagus was studded with nodules similar to those on the wall of the trachea and larynx. The thorax, the pericardium, and the heart were normal. There were adhesions and fluid at the left base of the pleura. On removing the sternum scattered nodules were seen over the surface of the lungs, grey and yellow in colour and varying in size; they were more numerous over the left lung. Of these disseminated glanders tubercles most were on the surface but some were deeply seated in the lung substance. On section some were tough in consistence, others were broken down in the centre and exuding thin fluid; all were surrounded by areas of inflammation. Except for some enlargement of the liver and spleen nothing of importance was found in the abdominal organs. The cartilages of the right knee-joint were healthy and there was no apparent thickening of the synovial membrane. The joint contained a yellow glairy fluid like that in the maxillary antrum.

Bacteriology.—On Jan. 23rd a needle was put into the right knee-joint and some yellow, glairy, odourless pus was obtained; this pus gave a pure culture of an organism which morphologically and culturally resembled the bacillus mallei (a subculture on potato showed yellowish moist colonies which ultimately turned brown). The pus was therefore sent to the Jenner Institute for intraperitoneal inoculation into a male guinea-pig and it produced orchitis and death in 12 days. The cultures made from the exudate of the tunica vaginalis of the dead guinea-pig were not, however typical, and a second guinea-pig inoculated with these cultures remained quite well except for a small swelling at the seat of inoculation. In explanation of this apparent discrepancy Zieler¹ is quoted by Bulloch² as showing that inconstant results are obtained as regards a typical "Strauss reaction" when pus from a human source is directly inoculated, whereas with pure cultures the result is unequivocal. I made the mistake here, therefore, of using the pus instead of the pure culture for inoculation. The blood culture grew staphylococci only and further cultures made at the post-mortem examination from the pustules and nasal discharge were contaminated with cocci and other organisms.

Histology.—A section through a nodule in the lung showed a mass of leucocytes in the centre, surrounded by epithelioid tissue, in which the alveoli were obliterated; further out the alveolar walls were much thickened and catarrhal cells were present in the alveoli. Sections of lung stained for organisms by Noniewicz's method showed some rod-shaped bacilli which were not, however, Gram negative and were probably putrefactive (the post-mortem examination was made 36 hours after death). The sections were kindly undertaken by Dr. Helen Chambers and further ones of the liver, the kidney, the spleen, the submaxillary gland, the nasal septum, the nasal ulcer, the pustules on the skin, the nodules in the larynx and maxillary antrum, the muscle of the face,

and the bone marrow were stained and searched for micro-organisms with the same disappointing result. I think, however, in some of these a few faintly staining organisms can be made out resembling bacilli mallei.

Remarks.—I should like to point out the close resemblance between this case and the second case reported by Dr. E. W. Goodall in THE LANCET;³ both cases were mistaken for rheumatic fever at the onset and in both the bacillus mallei was isolated from fluid obtained from a knee-joint. Secondly, the still closer parallel between it and the case mentioned in a leading article in THE LANCET,⁴ that of a horse-keeper in the employ of the Andrew Star Omnibus Company. In this case there was an onset with pleurisy, followed by pain in various successive joints, and the patient was regarded as suffering from rheumatic fever. After admission to a hospital pustules developed and the condition was considered to be one of septicæmia. A day before death it was suspected that the case might be one of glanders and cultures confirmed the diagnosis. Other points of interest in the case which I have recorded are: (1) the long interval between the involvement of the joints—too long for rheumatic fever; and (2) the combination of high temperature with a low pulse and respiration rate; this was well marked throughout the illness.

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RUPTURE OF THE UTERUS, WITH ILLUS- TRATIVE CASES.

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SOLUTIONS of continuity, with or without loss of substance, may arise during labour in any portion of the parturient canal. In the order of frequency the parts affected are the perineal body and lower end of the vagina, the cervix and upper part of the vagina, and the body and fundus of the uterus. The injuries vary very much in their extent and importance, the gravest being those that affect the body of the uterus and the upper part of the vagina. The lesion may arise suddenly, as in the case of rupture properly so called, or gradually, as the result of long-continued pressure of a hard part of the foetus on some particular portion of the genital canal. In the latter case the maternal tissues may be slowly burst asunder in the further course of parturition or they may be destroyed by a process of sloughing that is only completed some days after labour is ended. Ruptures of the uterus and upper part of the vagina may be complete, involving all the coats, or incomplete. In the latter case the lesion most commonly extends from within outwards, the muscular layers being more or less completely sundered; in rare cases the peritoneal coat only is affected or the tear begins in it and spreads inwards into the muscular layers. Where the injury involves the whole of the coats and a communication is established between the cavity of the peritoneum and that of the genital canal it is said to be perforating, as opposed to non-perforating or incomplete where the abdominal cavity is not opened. Estimates of the frequency of uterine rupture during labour vary very greatly, from 1 in 482 labours (Collins), 1 in 3403 (Jolly), to 1 in 4429 (Ramsbotham). The higher proportions have occurred in the practice of lying-in hospitals where there is a larger number of difficult deliveries. Taking the lower ratio as more nearly representing the actual facts, four or five ruptures probably occur every year in the city of Birmingham; many, especially of the graver cases, are, however, not recognised but are certified as deaths from post-partum hæmorrhage or from collapse or syncope following delivery.

Ruptures of the uterus during labour occur more frequently in multiparæ than in primiparæ, in the proportion of more than 8 to 1 (Bandl, 12 per cent. primiparæ). In a first labour the stronger pelvic attachments of the cervix and vagina and the firmer abdominal pressure tend to prevent the upward movement of the contraction ring, while the uterine tissues appear better able to resist excessive tension. When abnormal

¹ Über Chronischen Rotz beim Menschen, Zeitschrift für Hygiene, Band xlv., 1903.

² Centralblatt für Bakteriologie, Band xxxix., 1905, Heft i.

³ THE LANCET, August 26th, 1905, p. 589.

⁴ THE LANCET, June 17th, 1905, p. 1661.