follows. The liver showed marked fatty changes, with areas of focal necrosis, and around the areas of necrosis infiltration by lymphocytes and polymorphonuclear cells; there was also diffuse necrosis of the cells. The spleen was congested and showed a marked endothelial-celled proliferation, while there was often some flaky lymph to be seen in the peritoneum, and the intestines appeared congested. Cultures from the peritoneum, however, proved sterile.

The order in which the various series of mice died was interesting. Three mice were inoculated with the filtered sputum of "S. H." on April 23rd and all died on May 1st—that is, on the tenth day after inoculation. Retransmissions were made from the spleen, livers, etc., of these animals to three sets of two mice. The two mice from one set and one mouse from another died on May 5th; these were not retransmitted. The remaining three mice died on May 15th; retransmissions were made from these on May 16th, all of which died on May 18th. Three further rapid transmissions were obtained, after which the virus seemed to lose virulence, and mice, since inoculated, have remained alive to September, 1933. Whether this loss of virulence was in any way due to the storage of the livers and spleens of the last series in the ice-chest for several days before reinoculation we do not know.

In the case of the sputum from "E. H." the virus obtained never reached the same degree of virulence, the first set of mice inoculated not dying for thirty days, and no set of retransmissions dying in less five days. Moreover, this strain suffered the same fate as that from "S. H." after it had been stored for some days in the ice-chest.

When the first set of mice died on May 1st inquiries into the antecedents of the budgerigars elicited the following facts. The birds, about ten in number, were bought from a local dealer in February and were home bred. In March, 1933, one of the hens was "egg-bound" and died. To replace this bird another hen was obtained from Blackpool, and the mate of this hen became ill and died at the end of March. Both "S. H." and "E. H." handled this bird before and after death. The period of incubation in these cases appears to be ten and thirteen days respectively (approx.). From these investigations there seems little reason to doubt that the two cases described were cases of psittacosis, and confirmation of the diagnosis was obtained from the complement-fixation tests carried out by Dr. S. P. Bedson, to whom and to Dr. E. L. Sturdee of the Ministry of Health we are much indebted for help and suggestions.

SEROLOGICAL INVESTIGATION

It is now well established that viricidal antibody is developed in response to infection with a filterable virus. The presence of this antibody can be demonstrated not only by the neutralization reaction, but also by such purely test-tube reactions as agglutination, precipitation, and complement-fixation in current use in bacteriology. In psittacosis the neutralizing power of human convalescent serums is of an extremely low order,¹ and one would hardly have expected the complement-fixation reaction to be of any use, since in the case of most viricidal serums neutralization is more readily demonstrated than complement-fixation. However, one or two tentative experiments² suggested that convalescent psittacosis serums might fix complement specifically, despite the absence of detectable neutralizing power, and subsequent work has fully confirmed this.¹ The reaction is not given by every case, but a positive result in a carefully controlled test is of undoubted significance and the reaction a valuable aid to diagnosis.

Technique of the Test.—The technique of the complement-fixation reaction for psittacosis is carried out

according to the method devised for viruses by Bedson and Bland.³ Specific antigen consists of a 5 per cent. suspension of virulent mouse spleen in phosphate buffer or saline. A control antigen, made from normal mouse spleen or the spleen of a mouse suffering from some other virus infection such as ectromelia, is invariably used. This control antigen is of particular importance, because serums from individuals with a positive Wassermann reaction will give a false positive result with the psittacosis antigen; they fix complement equally well with the control antigen, however, and so reveal themselves. A known positive serum and one or more normal serums are included in the test.

Result of Test.—Serums were collected from these two cases on the fourteenth day of disease. The complement-fixation reactions tabulated below show that both serums contained psittacosis antibody, and leave little doubt that these were both cases of psittacosis.

Serum		2 M.H.D. Complement +			
Designation	Dilution	5 per cent. Virulent Mouse Spleen in Phosphate	5 per cent. Normal Mouse Spleen in Phosphate	Saline	
S. H.	1/1	++++ +++	—	—	
	1/2	++++ +++	—	—	
	1/4	++++ ++++	—	—	
E. H.	1/1	++++ +++	—	—	
	1/2	++++ +++	—	—	
	1/4	++++ ++++	—	—	
P. 112 (Hyperimmune guinea-pig)	1/4	++++ ++++	—	—	
N. 21 { Normal	1/1	—	—	—	
N. 22 { human	1/1	—	—	—	
Saline		—	—	—	

Degrees of fixation indicated by signs + + + +, + + +, and so on to —. Two readings taken, one after 30 minutes at 37° C. (upper row), and a second after standing overnight at room temperature (lower row).

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CHORIONIC CARCINOMA

BY

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Individual cases of this rare condition seem worth recording, as it is only by collating such reports that the full clinical picture and the results of treatment can be obtained. Chorionic carcinoma varies much in malignancy, but the highly malignant type predominates. The case here described followed a hydatidiform mole, and has remained free from recurrence five years after operation.

The patient, a woman of 32, who had had a normal confinement in 1920 and no previous illness, was admitted to Northampton General Hospital on April 5th, 1928, with a history of slight uterine haemorrhage for seven weeks, followed by two floodings; her last menstrual period had occurred fourteen weeks previously. When admitted she was in poor condition. The uterus reached 1 inch above the umbilicus, and was smooth and symmetrical. The cervix admitted one finger, and a boggy structure was felt; some vesicles escaped,

and the diagnosis of hydatidiform mole was thus easily made. Under ether anaesthesia a large hydatidiform mole and a foetus of about three months were evacuated; a hot flavine douche and pituitrin were administered. Recovery was uneventful.

The presence of a foetus is quite exceptional, and is evidence that the chorion must have functioned well for several weeks before abnormal epithelial proliferation began. The mole itself was large, but *all the vesicles composing it were minute*. It is usual in such cases for the vesicles to vary in size from a few millimetres to one or two centimetres in diameter, and I interpreted this as indicating great epithelial activity. I do not know if this signifies a greater liability to the development of chorionic carcinoma, but I suspected that it did, as there was so much evidence of growth and division. I urged the patient to submit to hysterectomy, although I had previously seen several cases of hydatidiform mole and had not considered that any of them required this method of treatment. The patient refused hysterectomy and even curettage, and went home on April 16th. I warned her and her doctor of the possible sequel, and asked that she might at once be sent into hospital if any bleeding recurred.

The patient was readmitted to hospital on May 13th at 3 p.m., with the following notes from her doctor: "She remained well until April 27th, when she had haemorrhage, which persisted fairly freely for twenty-four hours and ceased entirely in a week. Haemorrhage recurred at 3 a.m. to-day, and was considerable. The uterus was definitely distended with clots, which could be manually expressed." When I saw her soon after admission she was blanched and collapsed; the pulse was 144, temperature 96.2°, but haemorrhage had ceased. The foot of the bed was raised on 18-inch blocks, warmth was supplied, and saline and glucose administered per rectum, this method being chosen as less likely to restart bleeding. The uterus was palpably enlarged, the cervix and vagina were healthy, and no other swelling was felt.

HYSTERECTOMY

I was so strongly of opinion that the bleeding came from a chorionic carcinoma and not retained products that I decided not to risk further haemorrhage or dissemination by exploring the cavity, but to perform hysterectomy as soon as her condition permitted. A blood count the following day showed red cells 1,970,000 per c.mm. and haemoglobin 30 per cent. I gave a blood transfusion of twenty-five ounces with marked improvement, but the following day she was still unfit to undergo an operation, so I gave a second blood transfusion of sixteen ounces. On May 17th the pulse was down to 72, and her condition was quite good.

Under a general anaesthetic the vagina was swabbed out with violet-green and the cervix closed with a mattress suture. The abdomen was opened by a sub-umbilical incision. The uterus was about the size of an eight weeks' pregnancy; there was no sign of growth on its peritoneal surface, or invading the broad ligaments or glands, nor were there any metastases in the abdomen. I performed an ordinary panhysterectomy, including the Fallopian tubes. Although it is usually recommended to remove the tubes and ovaries with the uterus in this condition I retained the ovaries because chorionic carcinoma differs from other types of carcinoma in the absence of spread by lymphatic permeation¹; also this was an early growth in a young subject and I believed these ovaries were safe, and the advantages of preserving them were considerable. Recovery was uneventful, and the patient was very well when discharged to a convalescent home on the fifteenth day.

The Specimen.—The uterus contained a soft, dark-red growth, ovoid in shape, measuring 3 cm. by 1.8 cm. by 1.4 cm., and arising in the posterior wall of the body; its lowest point was 1 cm. above the internal os. It

protruded into the uterine cavity, and was in part covered with mucous membrane; at its centre it invaded the uterine wall for half its thickness. No vesicles of the preceding mole were present.

The microscopical report by Dr. Eric H. Shaw was as follows. "Section of the uterus shows the structure of a chorionic carcinoma. The muscle wall is infiltrated with large cells from Langhans's layer. There are some small syncytial masses, and there appears to be one formed chorionic villus. There is a large amount of blood among the cell masses."

The patient is perfectly well and free from all signs of recurrence now, five years after the operation, and has gained slightly in weight.

COMMENTARY

Interesting features of this case are:

1. All the vesicles of the preceding hydatidiform mole were minute; this indicated great epithelial activity and suggested malignancy.

2. Severe and almost fatal haemorrhage, necessitating two blood transfusions, occurred in an early and operable stage of the growth.

3. The preservation of both ovaries when panhysterectomy was performed, though it is not suggested that this conservatism would always be justifiable.

As regards operative technique, I would emphasize the necessity of first closing the cervix with a mattress suture, so as to eliminate the risk of implanting cancer cells in the pelvic tissues during the removal of the uterus. The vessels and broad ligaments should be doubly clamped before any traction or manipulation of the uterus is permitted, or minute fragments of this soft growth may be disseminated through the veins.

REFERENCE

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TREATMENT OF THE SEVERER CASES OF FRACTURED NASAL BONES

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By far the majority of fractured nasal bones are associated with rotation of the separated portions around a more or less vertical axis. There is usually not a very great tendency for the bridge to collapse. In the severer cases, however, where the bones are comminuted, the bridge often collapses, and means of treatment which would have been satisfactory in the milder cases would be unsuitable. In either case the importance of starting treatment early cannot be overestimated, and the day the injury is received is not too early to begin it.

The principles involved are: (1) to mobilize the parts so that they can be kept in the correct position without tension; and (2) to retain the parts in the corrected position until there is no tendency for the deformity to recur. These principles are comparatively easily satisfied where treatment has commenced early, but where more than a day or two has passed the difficulties increase rapidly. Mobilization is already present in recent cases, but where it is not it must be obtained by gripping the fragments with special forceps—one blade being in, and the other outside, the nasal fossa—and with it moving the fragments until they can easily be placed in any position required. When bony union has occurred, however, means of dealing with the deformity other than that to be described must be used. Fixation can be