A SMALLPOX EPIDEMIC

BY

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An epidemic of smallpox occurring among naval personnel and (European) civilian Admiralty employees is here described. The greater severity and length of the primary epidemic occurring among the native population are demonstrated, and its progress would appear to illustrate the very great prognostic value that can be attached to the presence and size of scars of previous successful vaccination.

Description of Outbreak

Smallpox is endemic in the Eastern Mediterranean area. During the winter of 1943-4, from the middle of November onwards, the weekly notifications for civilian cases steadily rose (see Graph). The rise was noted by the naval health

authorities, who in consequence started a campaign advising all naval medical officers to keep their vaccinations up to date.

On Jan. 25, 1944, the first naval case occurred in this area; there were subsequently 7 naval cases in all, with three deaths, and 3 cases among Admiralty (European) civilian employees, with no deaths. The last naval case occurred on March 11.

Naval Cases

Case 1.—Coder. Admitted to the isolation hospital on Jan. 25; had been in an H.M. ship and in a shore base during the incubation period; he gave no history of ever having been vaccinated, and had no scars of successful vaccination. This man developed confluent haemorrhagic smallpox, and died on Feb. 1, seven days after admission to hospital.

Case 2.—A.B. Admitted to the isolation hospital on Feb. 6, 1944. This man had been in a shore establishment. He stated that he had been vaccinated in infancy, but not since. He showed two small scars of successful vaccination. His was a mild case, and he made an uninterrupted recovery.

Case 3.—A.B. Admitted to the isolation hospital on Feb. 23, 1944. He worked in the Dockyard Salvage Unit and was accommodated in a naval hostel. He stated that he had been vaccinated in May, 1942, and showed one very small scar of successful vaccination. This man developed confluent smallpox, was extremely ill, but subsequently recovered, though badly disfigured by facial scars.

Case 4.—A.B. Admitted to the isolation hospital on Feb. 24, 1944. Had been in a large transit camp. He stated that he had been unsuccessfully vaccinated in 1941, but showed neither documentary evidence of this nor any scar of successful vaccination. He developed confluent haemorrhagic smallpox, and died on Feb. 28, five days after admission to hospital.

Case 5.—Leading seaman. This man had been a patient in a general hospital for one month at the time he contracted smallpox. He stated that he had been vaccinated in infancy and again successfully in 1942 and 1943. He showed three small scars of successful vaccination. His was a mild case, and he made an uninterrupted recovery.

Case 6.—Skipper. Admitted to a general hospital on March 1, 1944, and transferred to the isolation hospital on March 2. This man was from a converted fishing trawler, which had been in the base for three weeks before he contracted the disease. He thought that he had been vaccinated in 1943, and according to his pay-book

had been vaccinated in 1941. He showed no successful scars. He developed confluent haemorrhagic smallpox and died on March 4, the fourth day after admission to hospital.

Case 7.—Cook. Worked in a W.R.N.S. mess, and lived in private lodgings. Admitted to a general hospital on March 11, 1944, and transferred to the isolation hospital on the 13th. Had been vaccinated in infancy and again in 1942; he showed three good scars of successful vaccination. A very mild case, with an uninterrupted recovery.

Civilian (European) Admiralty Employees

Case 8.—Fitter. Worked in the dockyard. On Jan. 31, 1944, he had been discharged from a general hospital, where he had been in contact with a case which subsequently proved to be smallpox. He was immediately vaccinated. Admitted to the isolation hospital on Feb. 10. He stated that he had previously been vaccinated, and showed one small scar. A very mild case, making an uninterrupted recovery.

Case 9.—Shipwright. Admitted to the isolation hospital on Feb. 25, 1944. He stated that he had been vaccinated in March, 1942, and showed two small vaccination scars. His was a mild case, and he made an uninterrupted recovery.

Case 10.—Shipwright. Admitted to the isolation hospital on March 9, 1944; the second contact case. Stated that he had been vaccinated in 1939 and again in 1944 (after contact). He showed good scars of previous successful vaccination. A fairly severe case, but the patient made an uninterrupted recovery.

Case Occurring in a Corvette

Another case presumed to have been contracted in the area of the base occurred in a corvette. This ship was ten days at sea, outward bound to another port, where a member of the crew was landed suffering from what at first was thought to be measles, but which proved later to be smallpox. The ship's company were all revaccinated, and she returned to base.

On the fourteenth day after landing the patient in the other port, the ship's company were medically inspected. All showed good scars of previous successful vaccination; none contracted the disease, and the ship was taken out of quarantine. This ship carried no medical officer.

Table Summarizing Cases

Case No.	Date of Vaccination	Number and Size of Vaccination Scars	Remarks on Course of Illness
6	1941	None	Died (fourth day)
4	Unknown	"	" (fifth day)
1	None	"	" (seventh day)
3	1942	1 very small scar	Extremely ill with confluent smallpox; recovered, though scarred
10	1939 and after contact	2 good scars	Fairly severe case; recovered
9	1942	2 small scars	Mild case; recovered
2	Infancy	" small scar	"
8	Unknown	" small scar	Very mild case; recovered
5	Infancy, 1942, 1943	3 small scars	"
7	Infancy and 1942	3 good scars	"

Control

This epidemic occurred among personnel whose presence in the base was for the specific purpose of carrying out operations against the enemy. The epidemiological principles applicable to such an epidemic occurring among the civilian population in peacetime had to be modified to suit the situation as it arose. Fortunately it transpired that there was no increase in the incidence or severity of individual cases as a result. The primary consideration was that there should be the minimum interference in the movements of naval personnel on duty and in the operations of H.M. ships. At the same time it was recognized that to achieve this object successfully the epidemic in the Navy must be fully controlled in the minimum of time.

A somewhat bold policy of relying almost solely on vaccination was adopted. The efficacy of this policy was borne out by results, for, so far as is known, no contact of any naval case contracted the disease; though two civilian "European" Admiralty employees may have been infected from the same source or from one another.

In ships and establishments where a case of smallpox occurred the following action was taken: (1) All possible contacts were revaccinated immediately. (2) Direct contacts were paraded for medical inspection daily for 14 days; and their drafting was stopped for this period. (3) The ships and establishments concerned were not put in quarantine nor were

contacts isolated. (4) No drafting of naval personnel, other than direct contacts, was stopped provided they had been vaccinated and showed good scars.

Course of the Epidemic

By March 2 (thirty-six days after the first case had occurred in the Navy) there had been six naval cases; of these, three showed no scars indicative of previous successful vaccination, and a fourth had only a very small scar. It was decided, therefore, that the scheme was not working satisfactorily because all personnel were still not vaccinated, and that more drastic steps must be taken to obtain 100% immunity. Consequently, all leave to and from the base was stopped, and liberty-men were not allowed ashore unless in possession of documentary evidence of vaccination within the past two years.

These restrictions, especially the former, had the desired effect of making all naval personnel, and particularly officers, smallpox-conscious and vaccination-minded. From this date onwards there was a noticeable increase in the numbers presenting themselves for vaccination, and the epidemic in the Navy rapidly subsided. It was possible to raise the ban on leave by March 12.

Conclusions

1. In this epidemic the type of smallpox was virulent, the three fatal cases all ending within a week of admission to hospital.

2. All patients who had no scars of successful vaccination died. Only one patient who showed good scars contracted the disease, and no patient died who did possess any scars, even if very small, of previous successful vaccination.

3. Good scars of previous vaccination were good evidence of immunity in all, or in a very high percentage.

4. In the case of the corvette and the converted fishing trawler—both small ships where contacts must have been close and prolonged—all personnel had been successfully vaccinated and there were no secondary cases. In the latter ship another officer actually shared a cabin with the skipper, who died in four days of confluent smallpox.

5. It was found that issuing advice and instructions alone did not obtain 100% successful vaccination. This was achieved only when restrictions were placed on individual privileges.

6. For some time after the last naval case had occurred the epidemic among the civilian population continued.

Medical Memoranda

Human Infection with *Pasteurella septic*

Human infection with *Past. septic* is of rare enough occurrence to warrant recording the following case:

CASE REPORT

An African woman aged about 20 was admitted to the Maternity Hospital, Accra, Gold Coast, on Dec. 13, 1938. She was 28 to 30 weeks pregnant and complained of abdominal pain and headache. Temperature 104°; pulse 138; respirations 28. On Dec. 15 she gave birth to a premature infant, which survived only a few minutes. Her temperature did not settle, and a blood culture was made on Dec. 20. On Dec. 28 the left knee-joint was very swollen and a considerable amount of pus was aspirated. The joint was again aspirated on Dec. 30. The patient was discharged from hospital fit on Jan. 14, 1939.

Bacteriology.—From the blood and the two specimens of pus an organism, morphologically and culturally very suggestive of *Past. septic*, was isolated in pure culture. The patient's serum on Dec. 30 agglutinated a suspension of the blood organism to a titre of 1 in 640. White mice injected intraperitoneally with 0.2 ml. of pus from the knee usually died in 12 to 18 hours from septicaemia; one survived 72 hours and showed a fibrinous pericarditis, a sticky peritonitis, and septicaemia.

The cultures were sent to Prof. G. S. Wilson, London School of Hygiene and Tropical Medicine, who, after thorough cultural, serological, cross-immunity, and pathogenicity tests, reported the organism to be a typical strain of *Past. septic*.

Strains of *Past. septic* have been isolated on several occasions in this laboratory from the local wild-rat (*C. gambianus*) population, but this is the only human infection met with so far.

I wish to express my thanks to Prof. G. S. Wilson for the trouble he took over the investigation of the strain, and to Dr. W. M. Howells, O.B.E., Acting Director, Medical Services, Gold Coast, for permission to record this case.

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Reviews

PHYSICAL METHODS IN PSYCHIATRY

An Introduction to Physical Methods of Treatment in Psychiatry. By William Sargant, M.B., M.R.C.P., D.P.M., and Eliot Slater, M.D., M.R.C.P., D.P.M. (Pp. 171. 8s. 6d., plus 5d. postage.) Edinburgh: E. and S. Livingstone. 1944.

In this well-written book, descriptive of physical methods of treatment in psychiatry, the fundamental thesis is that in a considerable proportion of psychiatric illnesses, and in a sense in all of them, there is a physical substratum. Although this is a presumption, and not, as the authors are careful to explain, a matter of immediate knowledge, none will deny that they have made an excellent presentation of their case. This view goes naturally with an emphasis on constitutional factors as predisposing so largely in the occurrence of abnormal reactions under stress. The authors point out that psychiatrists have unfortunately been divided into two camps: those who are preponderantly interested in the psychological and those who are mainly interested in the physical aspects of mental disease. The authors plead, with evident justification, for a unification of the physical and psychological ways of treatment in psychiatric syndromes, and throughout the book they leave their readers in no doubt as to the need for supporting physical with psychological therapy. Drs. Sargant and Slater have pondered their experience with insight, and their clinical observations are often shrewd and original. Most of their work has been done with neurosis of war, and they are careful to say that the physical methods they advocate for the treatment of neurosis are apt to be less successful with the more complex neurosis of civil life. This unfortunately makes it impossible to be quite so enthusiastic as the authors about some of the methods they describe.

The various techniques—continuous narcosis, prefrontal leucotomy, etc.—are described in detail, and some relevant comments are made—for example, the need to treat epilepsy with more discrimination than is customary, taking into account the environmental circumstances instead of focusing only on the dosage of the drug employed; and they emphasize the usefulness of controlling their administration with electroencephalograms.

Since the book is likely to have a deservedly large sale it is as well to enter a caveat. The essential ingredient of all treatment is a human outlook. It is not that the book lacks it, but readers less experienced than the authors may be tempted into a very mechanical attitude towards the patient. Nowhere is it more necessary than in psychiatry to think first of all of the patient as a personality, with hopes and fears, rather than as a mechanism to be experimented with.

DOCTOR IN THE MAKING

Doctor in the Making. The Art of Being a Medical Student. By Arthur W. Ham, M.B., and M. D. Salter, Ph.D. (Pp. 120. 9s. 6d.) London: Medical Publications Ltd.

This is an excellent book which should be read by all studying in medical schools and those considering the medical profession as a career. It deals with the motives and mental equipment necessary for the successful medical student. The authors deplore the fact that so many people drift into medicine without the right basic education and ability and for no better motives than "because my father is a doctor" or "because my parents wanted me to be a doctor." There is an excellent section dealing with "the enemies of success," which gives most useful practical advice on how to work, how to improve powers of concentration, how to organize knowledge. The importance of understanding as opposed to memorizing is especially stressed. The chapters on the causes of maladjustment are clear and concise and free from technical terminology. The means for improving adjustment by the change of the ratio between demands and realization are well presented. The need for understanding and applying the scientific method of approach in medicine is emphasized, though the authors remark rather despairingly—perhaps the result of years of teaching medical students—that "it almost seems that scientific thinking is unnatural to man."