We all know from experience that all these diseases are closely associated. The statistics show us that zymotic diseases expend themselves as regards fatality in the first fifteen years of life. Accounting for over 26 per cent. of

Air-borne diseases, representing three of the five principal causes of death in sections of the community. A Curve: Bronchitis, pneumonia, and other respiratory diseases. B Curve: Ditto, plus zymotic diseases. C Curve: Ditto, plus consumption.

curve of pulmonary tubercle, which, starting with 2.29 per cent. in the 1-5 age period, 10.43 per cent. in 5-15, reaches its maximum of 33 per cent. in the age period of 15-25.

The researches in regard to cerebro-spinal fever have done much to elucidate the problem of the source of respiratory infection. (BRITISH MEDICAL JOURNAL, September 18th, 1920.) It has been demonstrated how readily the meningococcus passes from throat to throat in an overcrowded community, and how rapidly it disappears with efficient ventilation and spacing out. The carrier rate rises twice as rapidly in the presence of sufferers from catarrh, so that for the prevention of outbreaks of meningitis it is more important to isolate the people suffering from colds than it is to isolate carriers.

Again, quoting from the *Australian Medical Journal* of June, 1920, in regard to the etiology of pneumonia, as the result of war experience, "Pneumonia is probably due to many factors, of which the association with persons suffering from catarrh is the most important." "Victor Vaughan found that the incidence of pneumonia among American soldiers in training camps fell when overcrowding and bad ventilation were removed." "Catarrh affects persons whose naso-facial tissues are unhealthy . . . A person with a normal nose and throat does not acquire a catarrh." The same probably applies to the "carrier" condition. Experiments to inoculate a healthy nasopharynx with pathogenic organisms, so far as they have been attempted, have been a failure. The healthy mucosa readily disposes of them. Again, what is bronchitis, which causes more deaths every year than consumption, other than an extension of the common cold where the resistance is low or where it has been reduced by repeated attacks? Over 20 per cent. of consumptives give a history of repeated colds in the head (Osler and McCrae). Putting two and two together, therefore, the common cold is probably the most important connecting link between all respiratory infections; it is the means of (1) disseminating air-borne disease, and (2) of preparing the soil for further invasions or for the condition of carrier.

In conclusion, I feel convinced that the campaign against consumption must be directed against the air-borne diseases as a whole, and against the common cold in particular. The effects of other respiratory infections, including the common cold and zymotic diseases, in early life is to prepare the soil for the later invasions of the tubercle bacillus when otherwise resistance should be high. The remedy for all these diseases is a matter of improved housing and education in ventilation and general hygiene, yet at the same time much could be done meanwhile by the more thorough recognition and treatment of the common cold and its sequelae.

THE RELATION OF TEMPERATURE TO THE ONSET OF A CARDIAC IRREGULARITY.

BY

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Much has been written on the effect of temperature on the appearance of cardiac irregularity, and notably of the extra-systole. According to a number of observers there is a tendency for extra-systoles to disappear during high temperature, with a rapid pulse rate, after the manner in which they tend to disappear during exertion. Without any desire to controvert this view, which indeed is supported by much evidence, the following case is presented as affording in one direction a remarkable illustration of an opposite state of affairs, and possibly a sidelight on the etiology of this type of irregularity.

The patient, a young miner, was admitted on September 23rd, 1917, to the War Office Trench Fever Hospital, Hampstead, on the forty-second day from that on which he had contracted an attack of trench fever in France. When first seen he was suffering a typical relapse of this condition with backache, headache, hyperalgesia of his shins, muscular pains in the legs and shin-bone pain. He himself was well able, from his experience, to diagnose what was wrong. His temperature was then 103° F., his pulse was markedly irregular, and a prolonged polygraph tracing was taken. It was found that the irregularity was itself singularly regular, an extra-systole ventricular type occurring every third beat. Only very occasionally were there

FIG. 1.

"runs" of regular rhythm, and these lasted for but a few seconds when they occurred, and then gave place to irregularity again.

FIG. 2.

The first tracing was taken at 7.10 p.m. At 9.20 p.m. the temperature had fallen slightly, and the pulse was 100, but the extra-systoles were less frequent. At midnight the temperature was 101° F., the pulse 100, and the extra-systoles less frequent still.

FIG. 3.

At 10 a.m. the next morning the temperature was 97.7°, the

FIG. 4.

pulse rate 81, and there were no extra-systoles. The symptoms had markedly abated.

FIG. 5.

An interval of six days then elapsed, during which, so far as could be determined, there were no extra-systoles. On October 1st, however, the patient began to complain again, and took to his bed with a temperature of 102.5° F., and with a large number of extra-systoles—though not so regular an irregularity as on the first occasion. His pulse rate was 110. He had pains and aches

as on his first attack. Next morning he was well, with but an occasional extra-systole, and no further notice of him was taken until three days later, when his temperature went up to 104°F .; pulse rate 110. He was now found to have a perfectly regular pulse, and he had no muscular pain, headache nor backache. He had, however, marked abdominal pain and diarrhoea. (In his former attacks he had been constipated.) His pulse is here shown. (Fig. 6.)

FIG. 6.

From this point not a single extra-systole was observed until October 15th, though the temperature remained high for a week, reaching normal only on the 12th. On October 10th rose spots appeared on the abdomen, and paratyphoid B was found bacteriologically to be present. The pulse rate did not rise above 100 after the first day; on October 8th it was 90, and on the 10th 75.

On October 16th slight pain returned to the legs, which had been quite free from this symptom—most unusually, as he stated—and a few extra-systoles appeared. These continued off and on till the 22nd. On the 23rd his temperature again rose, and reached 103°F . on the 26th, but without pain or headache. He was sure this was not his trench fever, and had no extra-systoles. The pulse was 130. Temperature and pulse fell to normal on the 28th, and some extra-systoles at once appeared. On November 1st, another attack with pain and headache came on, and this was accompanied by a few extra-systoles.

The interesting point is that when they appeared the bouts of extra-systoles were always accompanied by trench fever symptoms, and that an exact eight-day periodicity was

FIG. 7.—Heavy line = extra-systoles per minute. Dotted line = temperature. A. Typical trench fever. B. Diarrhoea and abdominal pains. C. Trench fever pains. D. Abdominal pains; no trench fever pains.

shown in their onset. This is shown in Fig. 7. The temperature is also shown.

It is thus evident that the toxin of trench fever in this case produced a different effect on the rhythm of the heart from that produced by the toxin of paratyphoid B. Extra-systoles are relatively common in cases of trench fever.

THE HERPES-VARICELLA INFECTION.

BY

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GENERAL recognition has as yet scarcely been accorded to the contention, which was first advanced by Bokay¹ of Budapest twenty-nine years ago, and in support of which convincing evidence has been accumulating during the last few years, that herpes zoster and varicella own a common causal agent and are intercommunicable.

Further attention in this country was drawn to the association between these diseases by Dr. Le Feuvre in 1913, writing from Bulawayo. He reported nine cases in the *Guy's Hospital Gazette* and the *Medical Journal of South Africa*, in which varicella followed upon contact with herpes zoster; and others in which a varicella rash occurred in persons already suffering from herpes—the generalized rash appearing within five days after the appearance of the localized herpetic eruption. In this latter connexion he quoted a very pertinent observation by Adamson,² to the effect that in cases of herpes isolated vesicles may occur "sparsely scattered over all parts of the body," and suggested that this is in fact a scanty varicella eruption. It must be seldom that comprehensive search is made in a patient suffering from herpes for vesicles scattered over other parts of the body, but if this statement be generally corroborated it will constitute an

important link in establishing the contention that the two diseases are of identical origin.

Since Le Feuvre's first communication over fifty well authenticated cases have been reported in which varicella developed in persons who had been intimately associated with patients suffering from herpes zoster, and in each instance the probability of the infection having been contracted from other cases of varicella could be excluded.

Moreover, the interval between the appearance of the herpetic eruption in the one patient and that of the varicella rash in the other was within the recognized incubation period of the latter disease, or exceeded that period by no more than one day. Thus, in 51 cases in which the necessary dates and details are given this interval was:

10 days in	...	...	5	18 days in	...	...	1
12 "	...	...	1	19 "	...	...	5
13 "	...	...	6	20 "	...	...	1
14 "	...	...	13	21 "	...	...	3
15 "	...	...	2	22 "	...	...	1
16 "	...	...	4	"From 8 to 20 days" in 8			
17 "	...	...	1				

It is somewhat remarkable that of these 51 cases of varicella 8 were adults—rather a high percentage considering the infantile nature of the complaint.

In 1919 Dr. Cranston Low,³ in an illuminating paper rich in bibliography, concluded that these diseases are probably due to the same virus, and made the suggestion that in herpes zoster the infection spreads from the nose along the lymphatics to the olfactory nerves and the cerebrospinal fluid; whereas in varicella it is probably a blood infection.

The following history of three cases which occurred in one family last autumn seems to be worth recording. Three children living in a country house were together in a tram on September 4th. This was the last occasion upon which they were away from home together in any enclosed or crowded place. On October 1st one child developed varicella at a school to which she had returned on September 22nd. On October 3rd, another child developed the disease at home, and,

on October 4th, the third child developed it at another school 200 miles away, to which she had gone for her first term on September 21st.

Clearly, the three children contracted varicella independently, yet from some common source; and seeing that they had not been about together excepting in the country during the twenty-seven days preceding the appearance of the rash in the first case, it was at first difficult to explain how this had come about. The two school children had been certified, in good faith, before returning to their respective schools, as having been in contact with no infectious disease during the preceding three weeks, and it was a matter of considerable annoyance to all concerned that two schools should have become infected through them at the beginning of the term.

Whilst staying in the house in which they had spent their holidays the children's grandmother had suffered a very severe attack of supraorbital herpes, of which the eruption began to appear on September 14th. To this patient the children had limited access, and, in view of the fact that contact with any case of varicella can be excluded, the suspicion is very strong that the herpes was the source of their infection. In these cases the herpes-varicella interval was respectively seventeen, nineteen and twenty days from the first appearance of the herpetic eruption.

From the foregoing it appears that, sometimes at all events, herpes zoster is an infectious disease, contact with which is not rarely followed by varicella; but I have been able to find no recorded instance in which herpes in one patient has clearly given rise to herpes in another patient.

In all the cases that have been reported the varicella infection appears to have been contracted during the period of onset and development of the herpetic eruption, and no case has been reported in which it occurred as a result of association with herpes in its later stages. It is questionable, therefore, at what period of the attack the infection