of the collapse stage, it is important to note that the severe and prolonged vomiting and diarrhoea, the sweating and the massive localized oedema, are all factors in producing a state of dehydration, important from the therapeutic point of view.

It is commonly at this stage, two or three hours after the bite, that the patient is first seen by a doctor. In most cases by this time the oedema and discoloration have progressed some distance up the limb, and the site of the bite, at first painless, is beginning to be painful. In collapsed patients the swollen limb is often described as being very cold and blue, or even black. Collapse symptoms pass off as a rule about six to eight hours after the bite, and the temperature rises from sub-normal to 101 or 102°. This rise may be brief, or slight fever may last from a few days to a week. Diminution of urine is noted at this stage: in one severe case there was anuria for three days. Cardiac depression occurs, evidenced by slow pulse and low blood pressure.

The swelling and haemorrhagic discoloration of the bitten limb increase in extent and intensity for one to three days, and then gradually decline, the various colours of a bruise being manifested. Tenderness is marked, but there is comparatively little pain as a rule; on recovery pain is felt on moving the joints, and there is extreme muscular weakness. In no case was there any septic complication or gangrene. The prevailing fear of the latter sequel appears to be groundless, and is based, no doubt, upon memories of the past, when strong ammonia and other harmful caustics were commonly used in treatment.

Immediate Prognosis and Course of Illness

The most important factors governing the severity of the general reaction appear to be the size of the adder, the age and health of the patient, and the rapidity and correctness of the treatment. As regards age, of 12 cases in subjects under 12 years old all except two were severe. In the "teens" and young adults mild, moderate, and severe reactions occurred in about equal proportions. Of seven cases in persons over 45 years old five were severe.

The age of the patient has a marked effect upon the duration of the illness and disablement. Children, adolescents, and young adults recovered within a fortnight; the only exceptions other than fatal cases were one child whose swelling had not disappeared in four weeks, and another (my own case) who, on first using his bitten leg after 17 days, ran a temperature of 102° for about 24 hours and had symptoms similar to those noted at the onset, as though dormant venom had been liberated into the circulation by movement of the part. In middle-aged and elderly patients resolution is slower. A woman aged 54 had a swollen ankle for three months; a man aged 45 had a swollen arm for over six weeks; and a man aged 57 had some swelling for over a year, then suffered for many months from a stiff and painful shoulder and could not close his fist properly for months after the swelling had subsided. A gamekeeper "nearly lost his life and could not work for at least a year"; a lady states: "It was about six weeks before I could walk properly."

Remote Prognosis

Recovery appears to be complete and without serious after-effects. Dr. Stradling wrote: "Many bitten persons who have recovered from all primary symptoms produced by the poison eventually succumb to its influence, in remote and indirect effects, at a later period," but I have been unable to find evidence to support this view. Four severe cases have remained perfectly well and suffered no after-effects after a lapse of 13, 16, 23, and 24 years respectively since their bites. Two men, severely bitten in youth, have now reached 79 and 81 years of age without observing any after-effects. I have many reports of perfect health for shorter periods.

A doctor aged 60, bitten by very young adders, had only the slightest reactions at the time, but developed endarteritis two years later; he attributed this to his bites, but I gather that medical opinion was divided on the subject. Another doctor, middle-aged, shed all his finger- and toe-nails a year after being bitten, but suffered no other inconvenience and lived to the allotted span. One adult male states that he still, after six years, experiences some swelling and discoloration in the bitten hand each autumn; a woman bitten over 20 years ago still

has similar slight local recurrences of oedema. Another man developed phlebitis, starting at the situation (in the leg) where he had been bitten eight years earlier.

Fatal Cases

There have been seven deaths from adder-bite in England and Wales in the last 50 years. I have been unable to trace two of these. The five remaining subjects were aged 11, 4½, 6, 3, and 51 years respectively. The principal features in these cases may be tabulated thus:

No.	Sex	Age	Previous Health	Duration (hours)	Mode of Death
1	M	11	Delicate	12	Collapse; cardio-respiratory failure; conscious
2	M	4½	Healthy	60	Circulatory collapse; unconscious
3	F	3	"	6	" " "
4	F	6	Delicate	36	" " "
5	M	51	Insane W.R. +	26	Unconscious, with T. 102°, bounding pulse, and stertorous breathing

Note.—None of the above received antivenene serum.

Summary of Conclusions

The danger of adder-bite is greatest in high summer. Its clinical features are: (1) a local spreading haemorrhagic oedema; (2) a general reaction of very varying degree, from slight weakness to profound collapse.

About 50% of the cases give rise to real anxiety. In young children the "shock" reaction is severe; in the "teens" and young adults mild, moderate, or severe in equal proportions; in persons over 45, generally severe. Children, however, recover much more quickly than adults. Recovery is complete and without after-effects.

Fatal cases are rare, but death can occur even in quite healthy young children. In the fatal cases, none of which had received antivenene serum, death occurred in from 6 to 60 hours.

My thanks are due to all those doctors who have kindly supplied me with reports of their unpublished cases of adder-bite; also to many bitten persons who have supplied data otherwise unobtainable.

Medical Memoranda

Allergy to Moulds in England

In a paper on moulds and asthma (Fraenkel, 1938) I compared skin reactions to a mixed mould extract from *Penicillium*, *Aspergillus*, and *Mucor* types of moulds in Germany and in England. It was found that 16% of the asthma patients tested in Germany gave positive reactions to this allergen, whereas asthmatics tested in England gave 53% of positive reactions to the same mixture.

It has become evident from the American literature on mould allergy that regional differences in the incidence of positive reactions to moulds have been observed in the U.S.A. Balyeat found in Oklahoma positive reactions to moulds in only 1% of his patients; 12.2% were obtained in Los Angeles by Lamson and Rogers. They used extracts supplied by the Arlington Company, made up from four types of *Aspergillus* and of one type each of *Alternaria*, *Chaetomium*, *Monilia*, *Mucor*, and *Penicillium*—in all, nine different types. Feinberg, in Chicago, obtained 28% positive reactions towards one or more of several fungi.

Another paper was published by Schonwald from Seattle, and this author observed that 77% of his patients gave positive results to one or the other of 10 types of moulds. Schonwald stressed the point that there is a far more abundant growth of moulds in Seattle, with an average humidity of 85% in the morning and 51% in the evening, compared with average humidities of 42% and 27% respectively 300 miles inland. These facts explain the great part played by moulds in the aetiology of asthma in this district of the United States. His views were confirmed by the success of desensitization treatment with mould extracts in 86 patients.

The moulds are an important factor in hay-fever and in asthma because of the abundance of mould spores in the atmosphere and because, being much smaller than grass pollen, they are more easily inhaled and absorbed. They are present indoors and out of doors, particularly in a damp climate like that of England, and in many cases are probably responsible for the fact that an allergic patient is ill in one particular district, house, or room. Mould-infested beddings, feathers, mattresses, or even kapok can become the cause of asthma or other allergic

complaints, just as the *Cladosporium fulvum* Cooke on decaying tomato plants causes asthma in gardeners, or moulds in cheese cause other allergic irritations.

These observations seemed sufficient reason to study allergy to moulds in this country more closely. In my first investigations I was aided by Miss Frances Stephens, of the Natural History Museum Department for Mycology. I learned that there are probably more than 1,200 different types of moulds to be found in this country, and that culture of moulds, identification, and classification are often not easy (Fraenkel, 1939). The task is not made easier by the fact that they are able to form cross-breeds, with apparently new characteristics.

Out of that abundance of moulds it seemed advisable to choose for further investigations those which were likely to be most important as allergic factors. It was presumed that moulds which were found in closest contact with the body of allergic patients would probably be more important than others. In 40 cases of allergy, mostly asthmatics, but also cases of vasomotor rhinitis (including hay-fever), of eczema or urticaria, and of migraine, moulds were cultured from the patient's environment (dust, beddings, etc.) and excretions (sputum in asthma, nasal swabs in rhinitis, and faeces in skin cases). In a great number of cases identical moulds were found in both excretions and environment. Extracts of these were used for skin tests in the patient, and where these gave positive reactions the allergens were also employed to desensitize him. Pure cultures of moulds and extracts were kept in stock. The results of this method were encouraging, but the number of patients examined and treated was too small to justify final conclusions. A great deal of material and of assistance was required for the mould cultures, and I wish to thank Mr. F. R. Hackett, of the Southern Group Laboratory, for the help he gave me in this investigation. In the course of the war it became increasingly difficult to carry on the investigations when work of greater importance had to be given preference. It was therefore decided to use the six types of moulds most frequently found in our allergic cases as stock allergens for skin tests and for desensitization.

180 allergic cases have so far been tested with these six types of moulds, which had been isolated from the environment and from the excretions of allergic patients. Of these, 120 were asthmatics. 30 were cases of vasomotor rhinitis (including hay-fever), and the others cases of urticaria, eczema, and migraine. The first 100 cases of asthma were evaluated statistically, as the number of other cases so far examined was considered too small for such purpose. They have all been subjected to scratch tests to allergens from the following types of moulds and to a mixture of these in equal parts: (1) *Sporotrichon*, (2) *Cladosporium*, (3) *Penicillium*, (4) *Aspergillus*, (5) *Mucor*, (6) *Monilia*.

Table showing Results of 100 Cases of Bronchial Asthma tested with 6 Types of Moulds

	Positive (%)	Negative (%)
With mould mixtures ..	66 (+14; +52)	34 (±6; -28)
„ <i>Sporotrichon</i> ..	65 (++ +1; +25; +39)	35 (±6; -29)
„ <i>Cladosporium</i> ..	53 (++ +2; +19; +32)	47 (±5; -42)
„ <i>Penicillium</i> ..	44 (+8; +36)	56 (±4; -52)
„ <i>Aspergillus</i> ..	39 (+9; +30)	61 (±5; -56)
„ <i>Mucor</i> ..	40 (+12; +28)	60 (±5; -55)
„ <i>Monilia</i> ..	31 (++ +1; +8; +22)	69 (±4; -65)

The mould mixture gave the most frequent positive reactions, as could be expected; next to it came *Sporotrichon* types, with 65%, and *Cladosporium*, with 53%. Of the cases examined 44% gave positive reactions to *Penicillium*, 40% to *Mucor*, 39% to *Aspergillus*, and 31% to *Monilia* types.

The results obtained are very near to Schonwald's figures as reported from Seattle, the geographical position of which on the American continent is similar to that of England in Europe. It can be presumed that climatic conditions, especially humidity of the air, dampness of the ground, and consequently growth of moulds, are also somewhat similar.

From these observations it may be justifiable to draw the conclusion that allergy to moulds cannot be neglected in the examination and treatment of asthmatics or other allergic patients in this country.

Southern Group Laboratory,
L.C.C. Park Hospital.

E. M. FRAENKEL, M.D.

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Reviews

PREVENTION OF VENEREAL DISEASE

The Prevention of Venereal Disease. By L. Martindale, M.D., B.S., F.R.C.O.G. (Pp. 74. 2s. 6d.) London: Research Books, Ltd. 1945.

This little book is presumably written mainly for the general public, but it should also prove of interest to social service workers. The first part is devoted to an account of the three main venereal diseases, their symptoms, diagnosis, and treatment; the author makes the common mistake of stating that cold may kill the gonococcus, the very doubtful statement that syphilis can be transmitted to the 3rd and 4th generations, and slips up when she says that gonorrhoea is treated with penicillin for a total of 60 injections in 7½ days. Part II includes chapters on earlier experiments in legislation, an account of the success of the clinic system in Great Britain, war and legislation, notification, what Russia has achieved, and a final chapter on conclusions to be drawn. There are four appendices—the report of the Trevelthine Committee, notification and compulsory treatment in various countries, a list of V.D. clinics in Great Britain (which incidentally is not up to date), and the Oath of Hippocrates.

Few will quarrel with the theme that runs through the book—that continence is the one sure way of avoiding V.D., that the problem is a moral, just as much as, or possibly more than, a medical one, and that education of the public to make it V.D.-conscious should be the main plank in the anti-V.D. platform. Miss Louisa Martindale is a stout opponent of any form of compulsion, and has nothing good to say for Regulation 33B, which, however, has hardly been the failure she would suggest if account is taken of the results of acting on a single notification. Recommendations include sex instruction, cleaner films and a higher standard of literature, better housing and living conditions, healthy recreation, improved treatment facilities, and more almoners; nothing is said about case finding, which has given very good results where it has been undertaken with energy and tact.

SETTING A COURSE FOR CONDUCT

Thoughts, Deeds and Human Happiness. By K. W. Monsarrat. (Pp. 123. 7s. 6d.) Liverpool: The University Press. 1944.

Three years ago Mr. Monsarrat published *My Self, My Thinking, My Thoughts*, which was an analysis of self-expression. In the present volume he further examines human view-forming powers and habits—a design for living and how and by what action the social desires and aspirations of men may be fulfilled. In his introduction he refers to the present war as employing the greatest number of men that the nations can muster, and all the means that ingenuity has devised and industry can produce to kill or maim each other. Always there have been men who have been antagonists of their own kind and have chosen the robbing of others of their lives or of their chances of happiness as a means for contriving their own advantage. Mr. Monsarrat says: "It is not certain that the human race is inevitably condemned to recurring orgies of mutual torture and murder, but it is certain that it will have to find a new way of living wholly different from that which has been its habit, coupled with new views, valuations, and beliefs, if it is to escape them."

Each of us desires his own stability and prosperity; the only way to ensure this is by giving these benefits to others, supplying their needs and adding to their wealth. In developing his thesis of a design for living (albeit with some tautology) the author stresses that the effort by men to acquire good states *for themselves* always brings them to the brink of social ruin. Most of the book is occupied with the question of planning what we desire and the best principles of behaviour. There is a good chapter on self-expression and the means to understanding. Sense and intelligence are the keynote of this book—the word "sense" being used for that ability which gives a man a "view" or picture, and the word "intelligence" for his habit of interpreting his "views" in terms of actions that have brought about what the views show. The volume is thought-provoking and contains the foundations for believing in and following the right course of human conduct. It is, after all, a scientific enunciation of the Christian doctrine.