things, and on seeing objects such as houses for the first time they looked enormous. She thought some animals were much larger than she found them to be when she went to the Zoo. She had imagined that bears were as large as elephants, and the latter much larger still. Cats and dogs did not appear larger than she expected, probably because she had touched them when blind. She knew that dogs were of different sizes. Looking at a cat and a dog of the same size she could not distinguish one from the other unless the dog barked, but she could do so quite easily by touch. Objects which she could feel she was able to recognize, and thus learn to know by sight.

She is intelligent and has a good memory. She has asked many questions, and on being told what things were she has remembered. Looking out of the window at the Bath Eye Infirmary she saw an object going up the road outside. She knew it was some kind of motor vehicle as she had previously seen cars, but this was different. On describing it to another patient she was told that it was a motor van. Similarly with all the objects she saw—she had to learn what they were.

Faces at first looked alike, but she is now able to distinguish one from another. She was greatly disappointed with faces, as she said she had thought all people were beautiful and had "happy-looking faces." In looking at a print or photograph she has difficulty in telling the foreground from the background. Coloured pictures at first appeared just a mass of colour, but now she is able to a large extent to make out the subject of the picture. She likes bright things, and thinks flowers are beautiful.

She is a fluent braille reader, but of course did not recognize the ordinary printed word or figures, and had to learn the ordinary alphabet and figures before she could read the printed and written word.

As she did not understand what she was looking at she made progress by: (1) asking questions; (2) recognizing things by touch and then by sight; (3) recognizing things by smell and touch—for example, the different flowers, where of course colour helped; (4) recognizing things by knowing what she had read or been told.

VISUALIZING, ASSOCIATION, ETC.

She had no visual images until she obtained her glasses. The association of ideas in a person who has never seen are by sound—including sound of words—touch, and smell. Thought in the blind state is mainly word-thinking, but in the sighted it is mainly picture-thinking. Her association of ideas is now that of a sighted person—that is, dependent on visual images. She is able to describe objects which she has seen earlier.

At first she was very depressed and wept a lot—in fact, she must have gone through a great emotional strain. Probably she had not realized that she would have to learn all about visible objects, and more or less start again at the beginning. She was, so to speak, between two worlds. Eventually, as time went on, she gained confidence as her vision improved and her sighted knowledge increased.

On March 30, 1936, she obtained a post at a factory, starting at 10s. a week. After three months her wage was raised to 12s., at six months to 14s., and at a year to 16s. Now she is earning 19s. a week. Normally a girl leaving school starts at the age of 14 years at 10s. a week, rising to 18s. at 16.

Before the operations she had to be brought from her home to see me in Bath, but now she can find the way by herself, travelling by bus and walking to the Eye Infirmary.

She has joined the local company of rangers, and does the ordinary field work and plays games, but has difficulty in catching a ball. She can do general housework, dusting, polishing floors, and making beds; and when washing up does not break more things than a sighted person. She has not yet done any cooking. She goes to the cinema, and on her holidays enjoys sea-bathing. She watches her friends playing tennis, but cannot play herself as she cannot hit a ball with a racket. Although she can write well and read the printed word, she still finds it quicker to read braille. She has also visited London—seen Madame Tussaud's, the Zoo, and the theatres, etc.

More detailed psychological studies are being undertaken, and will be published later. There seems no doubt that, at least in the case of a person of the intelligence of the present one, it is possible for a previously blind person to make a fresh start in life as a sighted person, though in some of the cases described this has proved too hard a task.

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MOULDS AND ASTHMA

BY

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In a previous communication (1934) I published a list of allergens which had given rise to positive skin reactions in 522 cases of asthma observed by me in Germany. Of these patients 290 were males and 232 females. The reactions most often obtained were those given by extracts of house dust, bed feathers, and mattress stuffing. The next most frequent reactions in this series were those obtained from bacteria (108, 20.7 per cent.) and moulds (84, 16.1 per cent.). This latter figure is almost identical with Hansen's figure of 15 per cent. given in his record of asthma cases in Germany.

Storm van Leeuwen was the first to suggest that moulds, especially *Aspergillus fumigatus*, *mucor*, and *penicillium*, play a part as "miasms" in (a) climatic or (b) house allergens. In my own observations the patients were usually tested with *aspergillus*, *penicillium*, and *mucor* extracts, the original cultures being made from the residence of asthmatic patients.

More recently a number of papers have been published in the United States on the problem of moulds as a cause of asthma and hay-fever. Some of these investigations deal with mould extracts as supplied by the Arlington Chemical Company, who made preparations of four types of *aspergillus*, and one type each of *alternaria*, *chaetomium*, *monilia*, *mucor*, and *penicillium*; in all, nine different types. With these extracts Lamson and Rogers (1936), working in Los Angeles, found that of 1,259 patients tested 154 gave positive skin reactions (12.2 per cent.). Of these, sixty-six were positive towards *alternaria*, twenty-four to *chaetomium*, twelve to *Aspergillus fumigatus*, and fifty-two to others. On the other hand, Balyeat (1932), who carried out his investigations in Oklahoma, found that only 1 per cent. of 480 patients gave reactions towards moulds. Feinberg (1935), working in Chicago, found that sixty-eight patients out of a total

of 243 (28 per cent.) gave positive reactions towards one or more of several fungi.

Schonwald (1938), on the other hand, reports from Seattle that out of a total of 150 patients 77 per cent. gave positive skin tests to one or the other of ten types of moulds. Reactions were obtained most frequently with *Penicillium expansum* (77 per cent.), *Trichoderma kerningi* (72 per cent.), *Alternaria tenuis* (70 per cent.), and *Aspergillus niger* (68.6 per cent.), and were procured by means of scratches and intradermal reactions. The latter were, of course, comparatively the most frequent.

Brown (1936) tried sixty-eight different types of moulds and yeasts in twenty-four cases. He found that twelve cases were sensitive to saccharomyces and six to alternaria, compared with four who were sensitive towards aspergillus. Prince *et al.* (1937) tested twenty-nine different moulds in eighteen individuals in Texas, obtaining eleven positive reactions, of which he considered eight to be significant. Feinberg (1935) has pointed out that, apart from moulds, yeasts gave positive results in about 11 per cent. of the total number of cases tested. It has also recently been established by Wagner and Rackemann (1937) that old kapok which had been subjected to the action of moulds produced certain allergens to which patients were sensitive when they were not sensitive towards either the kapok itself or the mould alone. This indicates that not only are the moulds themselves a source of allergic reactions, but that these are produced, in addition, by some products of the action of moulds on other materials.

The great variation in the frequency of mould reactions in allergic patients apparent in different parts of the United States is explained by differences in the climate and the resulting frequency of the occurrence of mould spores in the atmosphere. The incidence of air-borne fungus spores varies in different places according to the humidity and other climatic factors. It has been pointed out by Schonwald (1938) that there is a far more abundant growth of moulds in Seattle, with an average morning humidity of 85 per cent. and evening humidity of 51 per cent., than 300 miles inland, where the average humidities are 42 per cent. and 27 per cent. respectively. These facts explain the great part played by moulds in the aetiology of asthma in this district of the United States; this is also proved by the success of desensitization treatment with mould extracts in eighty-six patients.

In hay-fever and in asthma the mould spore is an important factor because of its abundance in the atmosphere, and because, being much smaller than grass pollen, it is more easily inhaled and absorbed. This has been pointed out by Durham (1937), who, working in Chicago, found that there are more alternaria spores in the atmosphere than there are particles of rag-weed pollen. Observations were made in a number of towns during the months of May to November. From a total of over 5,000 observations made by an average number of fifty stations he comes to the conclusion that alternaria spores are an inhalant comparable in importance to ragweed pollen. The view that moulds are of importance is supported by Feinberg, Prince, Lamson, and Underwood, whereas Brown, Credille, van der Veer, and Rackemann have a more conservative view of their importance.

Bernton and Thom (1937) found that cladosporium acts as an allergen, causing asthma or hay-fever in tomato growers. This mould is responsible for the colour of decaying vegetables. It is also mentioned by Guba (1936) as causing the asthma associated with tomato plants.

Another cladosporium—*Cladosporium fulvum* Cooke—has previously been mentioned as a cause of asthma by Cobe (1932).

I have examined 185 allergic patients in England, of whom 148 suffered from asthma and twenty-one from hay-fever and rhinitis. The 148 asthma patients were made up of ninety-two males and fifty-six females. Of these males, eighty were tested with moulds, and positive results were obtained in forty-one cases. Of the females, fifty-one were so tested and twenty-eight gave positive results. Of the males, seventy-five were tested with bacteria, forty-six giving positive results. Tests with bacteria were also carried out on forty-five females, twenty-seven positive results being obtained.

Table giving the Incidence of Positive Skin Reactions towards Moulds and Bacteria in England and Germany

	Males		Females		Totals	
	Moulds	Bacteria	Moulds	Bacteria	Moulds	Bacteria
<i>England :</i>						
Tested ..	80	75	51	45	131	120
Positive ..	41 (51 %)	46 (61 %)	28 (55 %)	27 (60 %)	69 (53 %)	73 (61 %)
<i>Germany :</i>						
Tested ..	290	290	232	232	522	522
Positive ..	43 (15 %)	54 (18 %)	41 (18 %)	54 (24 %)	84 (16 %)	108 (21 %)

The table shows that positive skin tests with moulds and bacteria were obtained with comparative frequency in England, the figures with moulds being about the same as those reported by Schonwald from Seattle. On the other hand, the figures observed in Germany, which are similar to the 15 per cent. reported by Hansen for that country, compare with the results reported from the interior of the United States. It is most probable that this is due to the damp climate of England and Seattle, corresponding to their similar geographical situation in the two continents. The relative frequency of positive skin tests with bacteria cultured from asthmatic sputa is also probably due to the fact that infections of the respiratory tract are more common in wet climates than in others.

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The thirteenth Italian Congress for Occupational Diseases will be held at Bari from September 10 to 12 under the presidency of Professor L. Ferrannini, when the following subjects among others will be discussed: occupational pathology of aviation, occupational pathology of athletics, silicosis, adaptability of the Italian workman to the climate of East Africa, and results of the application of compulsory insurance against industrial diseases in the first four years. Further information can be obtained from the secretary, Dr. M. Majò, R. Clinica Medica, Bari.