

ETHICS AND PSYCHIATRY

In the contentious ethical field of abortion, severe congenital abnormality, and the contraceptive pill, Mr Kennedy rightly points to the shortcomings and inconsistencies of doctors' attitudes, which reflect similar uncertainties in society. He rightly says that the principles involved should be the subject of a wide and informed public debate, and that medical education should take account of the importance of such ethical problems. He seems to have encountered resistance to such changes in the medical-school curriculum. "We don't want to clutter up our timetable with well meaning Sunday school exercises" is placed within inverted commas, but again is not attributed. I can understand a reluctance to incorporating "ethics" as so many hours between, say, gastroenterology and cardiology: this is not necessarily the best way to deal with it. I have not, on the other hand, personally encountered a general resistance to incorporating ethical discussions in clinical teaching.

All this is quite innocent, but Mr Kennedy seems to imply more than this criticism. He seems to say (and a lack of specific suggestions creates some uncertainty) that individual problems should be dealt with by representatives of society as a whole rather than by the medical profession. Few would deny a need for a wide-ranging discussion with the patients involved: an ex-cathedra medical judgment is inexcusable. But there undoubtedly exists a substantial number of patients with whom informed discussion is likely to be limited or impossible. Mr Kennedy quotes disparagingly from Henry Miller: "The parents from whom difficult decisions are most likely to be required are too often drawn from the most feckless sections of the population". But such people do exist. Are decisions about the feckless to be dealt with by a statutory committee composed of representatives of the local authority, the D.H.S.S., trade unions, management, and perhaps even the legal profession? If they knew how such bodies worked in practice, the feckless would, I am sure, prefer to stick to their doctors.

The discussion of psychiatry in the fifth lecture unintentionally illustrates, by omission, the pitfalls of this approach. Mr Kennedy is greatly concerned with the threat to individual liberty posed by the confinement of psychiatric patients on medical advice. Medical expertise in this area is "in reality the exercise of moral, social, and political judgement concerning the worth of someone's thinking". This awful power ought to be devolved to lay people either in the form of a committee or jury. Yet there is no mention of the most infamous abuse of individual liberty by the misuse of psychiatry—an abuse which is still practised in the Soviet Union. But who in the Soviet Union is responsible for the redefinition of mental disease to include heterodox ideas? Whilst the doctors are nominally clinically responsible, they are acting as organs of the State in deciding who is or who is not mentally ill. Doctors may have their shortcomings, but there are far greater risks when they surrender their autonomy to others whose motivation may not be always disinterested.

CONCLUSIONS

I found this year's Reith lectures both stimulating and distressing. They are stimulating because they debate issues which are of great importance, distressing because of the superficiality of much of the content and the wildness of some of the language. The medical profession makes an easy target for this sort of criticism, with its effectiveness in hanging together in its own interest, the occasional pomposity of its

representatives, and the impression (not always unjustified) they give that medicine is for the delectation of the doctors rather than the health of the patients. In some cases, such as the ambiguous relation between science and medicine, Mr Kennedy has skirted around important problems without any real insight or understanding of what those problems are. He correctly diagnoses the weakness of preventive public health measures, but does not seem to understand the reasons for that weakness. He recognises the inconsistencies and shortcomings of doctors in dealing with ethical problems in clinical management and he emphasises the largely theoretical threat posed by modern psychiatry. On the other hand, he nowhere challenges the view that doctors are concerned with the welfare of their patients, even if he feels that they are misguided at times. His proposals would not resolve the problems he discerns, but would place the care of many patients in the hands of groups who would be subject to other pressures not necessarily in the patients' interest.

As an enjoyable and persuasive critique of the failings and greed of the medical profession, I preferred the preface to *The Doctor's Dilemma*.³ Several comments are remarkably similar to Mr Kennedy's, when, for instance Shaw says that "Doctoring is not even the art of keeping people in health, it is the art of curing illness". Shaw's belief that the medical profession is a conspiracy against the laity is often quoted out of context. His next sentences are perhaps even more apposite. "No doubt the same may be said of all professions and I do not suggest that the medical conspiracy is either better or worse than the military conspiracy, the legal conspiracy . . ."

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Occupational Health

PULMONARY HYPERSENSITIVITY IN PRAWN WORKERS

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Summary In a prawn-processing factory, workers were exposed to an aerosol of prawn. Nearly 40% of those exposed developed wheezing and other respiratory symptoms.

INTRODUCTION

HYPERSENSITIVITY to seafoods most commonly results from ingestion.¹ Bronchial asthma has, however, been reported in culture-oyster workers.²⁻⁴ We report here an investigation of respiratory symptoms which developed in a

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group of workers at a factory processing prawns (Norway lobster, *Nephrops norvegicus*).

PRAWN PROCESSING

The prawns were stored in crushed ice, transported to the factory, and deep-frozen until processed. They were thawed in cold water, the heads were removed, and the meat was blown out of the tails with compressed-air jets.

The factory concerned employed 123 people, 50 of whom worked in the prawn-blowing section (an area of 625 m²), applying prawns in rapid succession to the air jets, which blew the meat away from the operator against a partition. Small fragments of meat and droplets tended to spray in all directions. Of 50 workers interviewed, 18 had significant respiratory symptoms. 15 were prawn-blowers, and the remainder worked within 1 m of the prawn-blowing area.

CLINICAL FEATURES

Symptoms developed 6 weeks after the process at the factory had been changed from hand-peeling to air-blowing in February, 1977. At the time of the investigation (December, 1977) 17 female workers and the male production manager (age range 16–56) were affected, but 20 other workers with similar symptoms were already known to have left the factory since air-blowing had been introduced.

Symptoms developed between 30 min and 6 h of starting work, often persisting into the evening but disappearing at weekends and during holidays:

Symptoms	No. affected
Wheeze	18
Cough	17
Mucoid sputum	15
Breathlessness	15
Sneezing, nasal obstruction	11
Itching eyes	9
Itching hands	6

13 of the workers were cigarette smokers, 7 smoking 10–25 daily.

INVESTIGATIONS

Most of the 50 workers interviewed consented to the following investigations: full blood count including eosinophil count; prick skin tests to *Dermatophagoides pteronyssinus*, grass pollens, filtered prawn extract, and control solutions; serum for total IgE and IgE

specific to prawn protein and for precipitins to prawn protein; dynamic lung volumes.

RESULTS (TABLES I AND II)

Of the 18 workers with symptoms, 12 had significant reduction of vital capacity (0.5 litres or more below predicted level) and 8 of these consented to measurement of carbon-monoxide transfer factor (DLCO), arterial-blood-gas analysis, and chest X-ray. 2 volunteered to undergo inhalation challenge tests.

Pulmonary-function Tests

Table II shows the results of pulmonary-function testing in 12 workers who had reductions of vital capacity (VC). When symptoms were present, all had FEV₁ reduced below 70% of VC. Of the 8 subjects in whom DLCO was measured, 7 showed reductions of more than 1 standard deviation from the predicted level. Chest X-rays taken when symptoms were present were normal in all 8 of those with changes in pulmonary function.

Inhalation-challenge Tests

2 affected workers volunteered to inhale increasing concentrations of a freeze-dried extract of prawn protein resuspended in carbol saline from a Wright's nebuliser with a flow rate of 8 litres oxygen/min. Both subjects breathed an initial antigen concentration which produced a weal of less than 3 mm on prick skin testing. Thereafter, on consecutive days, tenfold increasing concentrations were inhaled up to a maximum concentration of 10 mg/ml. The total time of nebulisation was up to 5 min, this being divided into three periods (1 min, 2 min, and 2 min) with 10-min intervals between successive exposures.

Subject 3 developed dyspnoea, cough, and wheeze with bilateral rhonchi immediately after 3 min inhalation of a 10 mg/ml solution (fig. 1). These symptoms subsided after 2 h. There was no fever or change on the chest X-ray.

Subject 6 developed short-lived wheeze and dyspnoea immediately after inhaling a 10 mg/ml solution for 5 min (fig. 2). After 2 h she became breathless again, with an

TABLE I—DETAILS OF AFFECTED SUBJECTS

Subject no.	Age	Time of onset of symptoms after starting work	Eosinophil count (×10 ⁹ /l)	Atopic status (positive to two common allergens)	Prick skin test prawn extract	Total IgE u/ml (normal 40 u/ml)	Prawn RAST score (range 0–4)	Serum precipitin
1	42	3 h	0.80	+	++	109	0	+
2	18	2 h	0.20	–	–	34	0	+
3	34	2 h	0.41	+	++++	180	1	+
4	17	3 h	0.40	+	–	38	0	+
5	56	6 h	0.10	–	–	28	0	+
6	41	3 h	0.10	+	++++	160	1	+
7	25	2 h	0.20	+	++	282	2	–
8	42	1 h	0.20	–	–	32	0	–
9	26	1 h	0.30	–	–	23	0	+
10	40	1 h	0.00	–	–	19	0	–
11	27	½ h	0.20	–	++++	32	0	+
12	32	½ h	0.90	–	+	69	0	+
13	33	4 h	NA	+	++++	206	3	–
14	22	6 h	0.10	NA	NA	28	0	+
15	53	4 h	0.40	+	+	130	2	+
16	16	1 h	0.40	–	+	107	2	–
17	17	½ h	NA	–	–	34	0	–
18	25	3 h	NA	+	++	599	1	+

NA = results not available.

TABLE II—CHANGES IN LUNG FUNCTION IN 12 AFFECTED INDIVIDUALS WHEN SYMPTOMS PRESENT AND IN REMISSION

Subject no.	FEV ₁ /1 ATPS			FVC/1 ATPS			DLCO (mmol min ⁻¹ kPa ⁻¹)			PaO ₂ (kPa)
	Symptoms present	Remission	Predicted normal	Symptoms present	Remission	Predicted normal	Symptoms present	Remission	Predicted normal	Symptoms present
1	0.7	2.5	2.4	1.9	3.1	2.8	4.4	7.1	8.1	11.3
3	1.1	2.7	2.8	1.7	3.5	3.2	7.2	9.2	9.1	11.1
4	2.1	2.8	2.9	2.6	3.1	3.0	7.1	7.4	9.4	12.0
6	2.2	3.0	2.7	3.3	4.4	3.2	4.4	6.7	8.7	8.9
7	2.3	2.7	2.8	2.6	3.5	3.1	6.9		9.4	10.6
9	1.9	2.4	2.9	2.6	3.4	3.2	7.5		9.4	10.1
10	1.6	2.0	2.7	1.8	2.8	3.1	7.3		8.4	9.3
12	1.6	2.6	2.4	2.0	2.9	2.6	6.9		8.4	9.5
15	1.6	2.3	2.2	2.4	3.0	2.5	..		..	..
16	1.8	2.6	2.9	2.7	3.5	3.2	..		..	..
17	2.3	2.8	2.8	2.9	3.4	3.0	..		..	..
18	3.6	3.9	3.9	4.6	5.3	4.7	..		..	..

ATPS = atmospheric temperature and pressure saturated with water vapour.

unproductive cough, myalgia, and fever. There was a sharp fall in FVC with a proportionate reduction in FEV₁ (maximum reduction between 6 and 8 h). Chest X-ray was normal. There were no changes after inhaling carbol-saline alone. This subject had positive skin tests and precipitins. 2 healthy volunteers inhaled the 10 mg/ml solution without developing symptoms or any change in lung function.

Immunological Studies

Skin tests.—Immediate prick skin tests to the filtered freeze-dried prawn extract, reconstituted (10 mg/ml) in carbol-saline, gave positive reactions (weal >3 mm) in 7 of 18 affected workers. 6 of the 7 were atopic as judged from positive prick tests to *D. pteronyssinus* and grass pollens. 6 of

the 32 unaffected workers also had a positive prick skin tests to prawn, and 3 of these were atopic. 30 hospital outpatient controls gave no reaction to prawn protein.

Serum investigations.—9 of the affected workers had elevated levels (>40 units/ml) of total IgE measured by radioimmunoassay (Pharmacia). 7 of this group had a raised prawn-specific IgE as measured by the radioallergosorbent test (RAST, Pharmacia) with RAST score of 1 or more. All of these had a positive immediate skin test to prawn. Of the 32 other workers, 11 had elevated total IgE and 1 had an increased prawn-specific IgE. Sera were also screened for prawn precipitins with agar-gel diffusion and counter-immunoelectrophoresis. 12 of the 18 affected workers and 19 of the 32 unaffected workers gave positive results. 20 blood-donor control sera were negative.

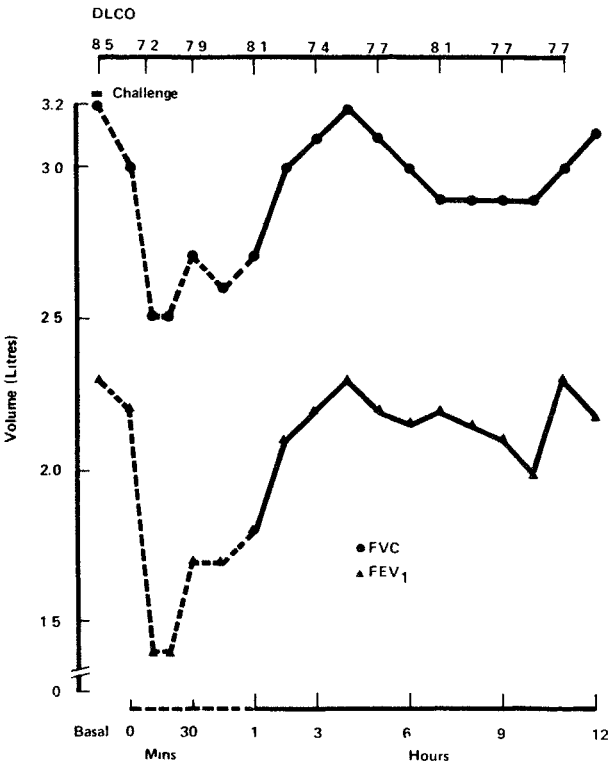


Fig. 1—Subject 3: lung function after inhalation of prawn extract (10 mg/ml) for 3 min.

DLCO = carbon-monoxide transfer factor.

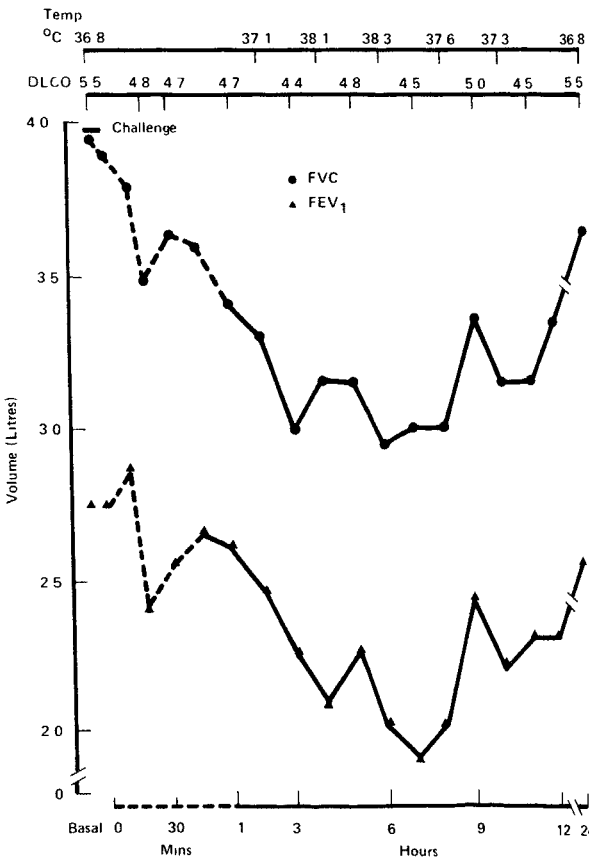


Fig. 2— Subject 6: lung function after inhalation of prawn extract (10 mg/ml) for 5 min.

DLCO = carbon-monoxide transfer factor.

Factory Atmosphere

It was clear that an aerosol of prawn material was created by the air-blowing process. Air-sampling with preweighed filters was carried out. The wet weight of material filtered from air in the prawn-blowing section 1.8–3.3 mg/m³. In June, 1978, the compressed-air jets were replaced with cold-water jets. Symptoms disappeared from all but 3 subjects (all atopic), who still have intermittent mild wheeze at work. Air-sampling showed a reduction of material filtered from the air to 0.1–0.3 mg/m³.

DISCUSSION

The air-blowing technique created a respirable aerosol of prawn which resulted in hypersensitivity reactions in an unusually high proportion of the factory workforce.

Around 10% of the general population have an atopic tendency,⁵ but in this group of workers, 24% had positive skin tests for prawn and 62% had serum precipitins. Positive prawn prick skin tests and RAST tests were found more commonly in affected subjects than in those with no symptoms, but serum precipitins were equally prevalent in both groups. 3 workers with symptoms had neither positive skin tests nor precipitins.

36% had symptoms. In most subjects an asthma-like reaction (probably IgE-mediated hypersensitivity) developed within 15 minutes of exposure. In others the illness occurred later, suggesting either delayed asthma or a type-III hypersensitivity response at alveolar level with fever and functional changes consistent with this. (Crepitations were not heard on auscultation and X-ray changes were not observed, but these negative signs can occur in some varieties of allergic alveolitis.^{6,7}) The existence of these different patterns of response was suggested by the bronchial-challenge tests.

A substantial number of people are working in the shellfish-processing industry, many using air-blowing. Although we have no evidence so far of permanent lung damage, the symptoms are serious enough to warrant prohibition of air-blowing and to require surveillance of workers using water-blowing methods.

We thank Dr D. T. Kay, who first alerted us to the problem, and the workers and management of Tullis Cold Store Ltd. for their cooperation in the investigation. Pharmacia (G.B.) Ltd. kindly prepared the prawn discs used in the RAST tests. Mr Stuart Campbell, of the Factory Inspectorate, and Dr C. Roythorne, of the Employment Medical Advisory Service, gave much help and advice. We also thank Mrs Joyce Leys, Miss Rhona Crawford, Mr David McKenzie, and Mr Charles Broadfoot for expert technical help and Mrs B. Calder for secretarial assistance.

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Occasional Lion

ENDORPHINS, I PRESUME

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EXPERIMENTAL and clinical observations suggest that endorphins may play a part in the response of mammals to pain and stress. I shall not attempt to interpret here the biological role of endorphins but merely call attention to an excerpt from the journals of David Livingstone¹ which provides an unusually articulate description of his own reactions and sensations during an incident which must have caused extreme emotional stress and, one would have thought, severe physical pain. Livingstone was standing on a grassy knoll slightly separated from his companions when he was suddenly attacked by a large male lion. In his own words, "I heard a shout. Starting and looking half round, I saw the lion just in the act of springing upon me. I was on a little height; he caught my shoulder as he sprang and we both came to the ground below together. Growling horribly close to my ear, he shook me as a terrier does a rat. The shock produced a stupor similar to that which seems to be felt by a mouse after the first shake of a cat. It caused a sort of dreaminess in which there was no sense of pain nor feeling of terror, though quite conscious of all that was happening. It was like what patients partially under the influence of chloroform describe, who see all the operation but feel not the knife. This singular condition was not the result of any mental process. The shake annihilated fear, and allowed no sense of horror in looking round at the beast. The peculiar state is probably produced in all animals killed by carnivora; and if so, is a merciful provision by our benevolent Creator for lessening the pain of death".

Anecdotes about the reactions of prey when attacked by predators in the vast plains and savannas of Africa are abundant. The initial "fight or flight" response of the prey to an attack by a predator is easy to understand, but the reaction during the terminal phase seems unusual. At an ill-defined point in the encounter the prey often seems stupefied and no longer resists the assault but seems to settle into a peculiar state of resignation where no evidence of pain is apparent to an observer. An inappropriate tranquillity of the prey while being literally eaten alive has been described by hunters, wardens, travellers, explorers, and others as related to a "state of shock" which certainly is seldom explicable by any known mechanism such as hypovolaemia, transection of the spinal cord, hypoxia, brain injury, or any of the recognised traumatic injuries which may result in alteration of consciousness.

It is unusual to discover a mammal with the ability to describe the experience of surviving an attack by a predator. Perhaps Livingstone's vivid description puts us in a better position to understand the behaviour in similar circumstances of the wildebeest, the zebra, or the impala. Obviously any relationship to endorphins is highly speculative.

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