Thorax (1973), **28**, 660.

Proceedings of the Thoracic Society

A joint meeting of the British Thoracic and Tuberculosis Association and the Thoracic Society was held on 11–13 July 1973 at the University of Nottingham. There were 25 short papers, one symposium, and one open lecture. Summaries follow.

IN SEARCH OF LAËNNEC—A PILGRIMAGE TO QUIMPER

ALEX SAKULA René Théophile Hyacinthe Laënnec was born on 12 February 1781 in Quimper and spent much of his childhood in Nantes where his Uncle Guillaume was Head of the Faculty of Medicine. He was much influenced by his uncle and proceeded to Paris to study medicine, qualifying in 1802. His contact with Corvisart and Bayle stimulated his interest in respiratory diseases and tuberculosis, from which he himself suffered. His clinical experience as well as his morbid anatomical studies at the Hôpital Necker culminated in his invention of the stethoscope and his writing in 1819 *de l'Auscultation médiate* which may be regarded as the pioneer treatise from which modern chest medicine has developed. Despite his great success and renown in Paris, Laënnec always retained a great love for his native Brittany and eventually, because of ill health, he was forced to retire there to his home at Kerlouarnec, near Quimper, where he died on 13 August 1826.

A recent visit to France in search of various associations of Laënnec is described.

THE WRITINGS OF LAËNNEC

P. J. BISHOP The importance and influence of Laënnec's *de l'Auscultation médiate, etc.*, has perhaps tended to overshadow his other writings. Between 1802 and 1814 he contributed about 100 original observations and annotations to Corvisart's *Journal de médicine, etc.* plus about 60 book reviews. His M.D. thesis of 1804 on the Hippocratic method, his unpublished Traité d'anatomie pathologique, his Mémoire sur les vers vésiculaires are all important. Between 1812 and 1816 he contributed 10 articles to the *Dictionnaire des Sciences Médicales*, which appeared in 60 volumes over 10 years. His *de l'Auscultation médiate, etc.*, which introduced the stethoscope and provided medicine with the first truly modern work on chest diseases, had already appeared in five editions by his death in 1826. By now it has been edited, translated or reprinted over 30 times. His course of lectures at the Collège de France, unpublished in his lifetime or since, reveal his broad knowledge of medicine. His letters and manuscripts constitute a valuable addition to printed sources. Finally, his miscellaneous writings reveal something of his personal character. Although he has been the subject of more than 50 biographies in book form, and some hundreds of papers on almost all aspects of his life and work, like all great names in the history of medicine his life and writings are eminently worthy of study.

CONTROL OF BREATHING IN RESPIRATORY FAILURE

Current Concepts of Central and Peripheral Chemosensitivity

S. J. G. SEMPLE It is often possible to predict the response of the central respiratory control mechanism to acid-base disturbances from the factors which determine the environment of the respiratory neurones and/or receptors. These factors include the properties of the blood brain barrier, the mechanisms governing the control of cerebral blood flow, and the metabolic and buffering characteristics of brain tissue. For example, the blood brain barrier is probably responsible for the differences in respiratory response to metabolic and gaseous acid-base disturbances, while alterations in brain metabolism explain some of the changes observed in chronic hypoxia and in respiratory alkalosis.

Experiments on animals have shown that the response of the peripheral chemoreceptors to alterations in arterial carbon dioxide tension is extremely rapid which would be expected from the structure and blood supply of the carotid body. The response to metabolic acid-base disturbances is less well defined but it is probably slower, suggesting that there is some barrier to the rapid movement of bicarbonate between blood and extracellular fluid in the carotid body.

The importance of the peripheral chemoreceptors in the respiratory response to hypoxia is well documented but their role in other acid-base disturbances in man is quite unknown. Two possibilities are considered: first, that they play no part in the respiratory response to acid-base disturbances: second, that they have an important role in determining the speed of response of the respiratory control mechanism as well as the response to transient acid-base disturbances.

Factors Determining the Response to Inhaled CO_2 in Normal Man

I. R. CAMERON and J. LYALL The respiratory response to inhaled CO_2 has been widely used as a measure of the sensitivity of the respiratory control mechanisms. Many studies have revealed that individuals vary considerably in their response to inhalation of CO_2.

this paper is concerned with some of the factors which may contribute to these differences. In some circumstances the technique used to assess CO_2 responsiveness may be critical to the findings. In normal individuals sensitivity to inhaled CO_2 may vary with sex, age, and race. Athletes may be less responsive than the untrained, and individuals with a low response may suffer a larger depression of ventilation during mechanical loading. There is no evidence available to determine whether these variations are inherited or acquired, nor whether individuals of low responsiveness are more liable to hypercapnia if they develop chronic lung disease.

This study concerns the ventilatory response to inhaled CO_2 of children (aged 14–40) of normal parents and children, one of whose parents has had a known episode of hypercapnia due to chronic lung disease. It is an attempt, therefore, to investigate an inherited tendency in the ventilatory response to CO_2 and to describe its distribution in a normal young population.

Patterns of Breathing, Work Cost, and CO_2 Responsiveness

D. J. LANE Hypercapnia in patients with airflow obstruction is initiated by ventilation/perfusion imbalance. Persistence of this hypercapnia follows if the response of the total respiratory apparatus to the increase in CO_2 is depressed. An abnormally small increase in ventilation during the breathing of CO_2-enriched inspired gas is the index of this depressed response. This may be due to central insensitivity to CO_2 or to the mechanical limitation imposed on the system by the airflow obstruction. Analysis of the work output of the inspiratory muscles as an index of central sensitivity has revealed a few patients, relatively untroubled by dyspnoea but with marked CO_2 retention, who appear to have a grossly reduced central sensitivity. Others markedly dyspnoeic but often without CO_2 retention have normal sensitivity, ventilation being limited by mechanical factors. A majority of patients are intermediate between these extremes. These differences in work response have been related to different types of tidal volume/respiratory frequency pattern response. The maximal tidal volume achieved was limited by the size of the vital capacity, and the frequency increase was negligible in those with diminished central sensitivity.

Hypoxic Drive to Breathing in Normal Man and Patients

D. C. FLENLEY and A. G LEITCH In 2 of 12 patients with chronic bronchitis and emphysema we were unable to demonstrate a hypoxic drive to breathing (Flenley, Franklin, and Millar, 1970). This is evidence that variations in the hypoxic drive may underlie differences in clinical presentation of patients with chronic bronchitis and emphysema (Thurlbeck, Henderson, Fraser, and Bates, 1970).

To establish this hypothesis we must demonstrate deficiency of hypoxic drive in otherwise healthy subjects living at sea level. Accordingly we have studied the ventilatory response to 'switching off' the chemoreceptor by substitution of five breaths of 100% oxygen for 14% oxygen during steady state exercise ($\dot{V}O_2$ 1 min^{-1}) (Cooke, King, Kuan, Siddorn, and Flenley, in preparation). We have also studied the ventilatory response to 'switching on' the chemoreceptors by inhalation of three breaths of 100% nitrogen during exercise while breathing air.

In the 'switch-off' experiments the relief of hypoxaemia led to a transient fall in ventilation which could be clearly distinguished from control values in normal subjects with an intact hypoxic drive. We have studied the ventilatory response to 'switching on' the chemoreceptors in 37 healthy Scottish miners, expressing the response as 'hypoxic index'. Using this method we have been unable to demonstrate a hypoxic drive to breathing in four of these miners.

If these responses are repeatable, we suggest that the 'switch on' experiment will prove to be a safe, simple and effective method of quantitating the hypoxic drive in normal man.

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RIFAMPICIN ABSORPTION

D. SIEGLER and K. M. CITRON Administration of rifampicin on an empty stomach is generally recommended in spite of its inconvenience and conflicting evidence about the effect of meals on rifampicin absorption.

Blood levels and urinary excretion of rifampicin were measured in patients receiving the drug, in the fasting state and also after a standard breakfast. Considerable variations in rifampicin absorption were found. Factors responsible for the differences in absorption are presented and possible consequences of the variations on therapeutic potency are discussed.

PULMONARY FUNCTION IN URAEMIC PATIENTS

H. Y. LEE and T. B. STRETTON Pulmonary function has been studied in 55 patients with renal failure. Groups of individuals with different aetiological causes of uraemia have been investigated to see whether there are different patterns of abnormality in lung function in these various groups. A substantial reduction in the transfer factor for carbon monoxide has been found, and this appears to be independent of the nature of the renal disease and of complications such as anaemia and left ventricular failure. Present findings suggest that the membrane component (Dm) is largely responsible for this defect in gas transfer. Data on pulmonary function are valuable in such patients, who run the risk of additional respiratory complications, especially during dialysis and after renal transplantation when cytotoxic drugs are introduced.

EFFECT OF DRUGS ON GOBLET CELLS OF RAT AIRWAYS

LYNNE REID, ROSEMARY JONES, and P. BOLDUC Isoprenaline and pilocarpine have a similar effect on rat airway epithelium in that each produces an increase in the number of goblet cells and an increase in the size of the submucosal glands. They differ in other respects, such as the type of goblet cell mainly responsible for the increase. Isoprenaline resembles the effect of phenylmethyloxadiazole (PMO, an anti-inflammatory agent) in that secretion seems to be retained within the cell.

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RIGHT VENTRICULAR OVERLOAD AS A CAUSE OF IMPAIRED LEFT VENTRICULAR FUNCTION

D. G. GIBSON Right and left ventricular function have been assessed by echocardiography in patients with pulmonary hypertension and right ventricular overload for a variety of causes. In the normal subject, echoes can be recorded from the interventricular septum and posterior wall of the left ventricle. These approach one another during systole as the cavity size gets smaller and diverge again during diastole. This pattern is taken to represent a normal left ventricular contraction. In the presence of pulmonary hypertension the direction of septal movement has been found to be reversed so that it behaves functionally as part of the right ventricle. This movement is paradoxical with respect to the left ventricular cavity, but posterior wall movement is increased to compensate. It is concluded that right ventricular overload from any cause may result in reversed septal movement. This may contribute to the impairment of left ventricular function that occurs in the presence of lung disease.

CHEST WALL TUMOUR FOLLOWING IODIZED TALC PLEURODESIS

J. W. JACKSON A man aged 37 was admitted with a right-sided spontaneous pneumothorax in May 1968; it resolved without treatment but recurred early in July when iodized talc pleurodesis was advised and carried out. He attended in 1970 because of the chest pain localized to near the thoracoscopy incision. A provisional diagnosis of talc granuloma or sterile chemical abscess or tumour was made. The tumour turned out to be a poorly differentiated carcinoma with squamoid and adenoid features.

STRANGULATION OF THE HEART

P. K. JAYARAM and DEWI DAVIES A man had a right pneumonectomy for carcinoma of the lung. About five hours after the end of the operation he suddenly complained of chest pain, became unconscious, and had convulsions. A diagnosis was made of herniation of the heart through a pericardial defect; this was corrected at a second operation and the postoperative course thereafter was uneventful.

INTRACRANIAL TUBERCULOMAS WITH UNUSUAL FEATURES

D. C. THRUSH Although intracranial tuberculomas still represent a large proportion of space-occupying lesions in the world, they are rare in this country. During the past 12 months we have investigated three patients with intracranial tuberculomas, each of whom has shown unusual features. These are described.

PNEUMOCYSTIS PNEUMONIA COMPLICATING LYMPHOSARCOMA

G. K. KNOWLES and M. TURNER-WARWICK A 16-year-old Malaysian boy was found to have lymphoblastic lymphosarcoma, for which up to August 1972 he was treated successfully with radiotherapy and chemotherapy. At that time he developed a recurrent illness characterized by pyrexia, dry cough, and bilateral lung shadows, which responded dramatically to prednisone on each occasion, until December 1972 when an identical clinical and radiological picture emerged with very little resolution on steroids. A diagnosis of *Pneumocystis carinii* was established on closed lung biopsy and he recovered completely following an 18-day course of pentamidine.

TREATMENT OF INTESTINAL GAS CYSTS WITH OXYGEN

P. H. WRIGHT, P. FORGACS, and A. P. WYATT A patient with severe diarrhoea due to gas-filled cysts in the wall of the descending colon and rectum is reported. One of the submucosal cysts protruding into the rectum was sampled and was found to contain a high concentration of hydrogen. The cysts disappeared during six days' continuous breathing of 70% oxygen and did not recur during the following six months' observation. He remained free from symptoms from the second day of treatment onwards. Two further patients have since been successfully treated.

It is suggested that cysts in the wall of the gut unlike gas in other closed cavities inside the body persist because they are replenished by diffusion of intestinal gas at a rate which equals or exceeds the rate of absorption. The principle of treatment by oxygen breathing is to wash out the nitrogen from the tissues and to alter the balance in favour of absorption.

AN UNUSUAL FORM OF AIRWAYS OBSTRUCTION

G. J. GIBSON and P. DAVIS Relapsing polychondritis is a chronic inflammatory disease affecting cartilage-containing tissues and usually associated with systemic manifestations. One of the major sites of disease is the cartilage-containing airways and death has often been attributed to laryngotracheal 'collapse' (Hughes *et al.*,

Quarterly Journal of Medicine, **41**, 363, 1972). There appear, however, to have been few studies of pulmonary function in life. The case is presented of a non-smoking 36-year-old Iranian with clinical evidence of polychondritis in whom stridor was a prominent feature. He has radiological evidence of narrowing of the trachea and main bronchi and severe airways obstruction. This is predominantly of an intrathoracic rather than extrathoracic pattern but he differs from patients with more usual types of intrapulmonary airways obstruction in having no evidence of small airway disease.

BECLOMETHASONE DIPROPIONATE AEROSOL IN ASTHMA

R. S. FRANCIS A study is reported on beclomethasone dipropionate aerosol in 25 adults and 15 children with asthma. Most of the adults were steroid-dependent. Some of the children were steroid—or ACTH—dependent.

Patients kept daily diaries of severity of wheezing and of all treatments used. $FEV_{1\cdot0}$, FVC and PFR were measured weekly. After a baseline period of observation, adrenal function was assessed by the tetracosactrin stimulation test and regular treatment with the steroid aerosol was instituted for an 8-week period during which daily diaries and weekly measurements were continued. At the end of 8 weeks the tetracosactrin test was repeated.

During the trial period patients were free to continue whatever other treatment they considered to be necessary. The following results are expressed numerically, comparing the control period with the 8 weeks on beclomethasone:

1. wheezing score
2. $FEV_{1\cdot0}$
3. PFR
4. oral steroid, or ACTH dosage
5. dosage of all other medications used
6. tetracosactrin tests of adrenal function.

During the trial most patients were able to discontinue ACTH or oral steroids and to reduce other medications. Wheezing scores and ventilatory tests improved significantly in adults and children. In steroid-dependent adults, the initial tetracosactrin tests mostly indicated adrenal hypofunction but marked improvement was noted at the end of the trial. The tetracosactrin tests in children showed fewer completely normal results at the end of the trial than in the control period. These findings are discussed.

BRONCHIAL COMPLIANCE IN HUMAN POST-MORTEM LUNGS

A. G. WILSON, G. MASSARELLA, and N. B. PRIDE In chronic airflow obstruction airways conductance increases very little as lung volume is increased. We have investigated this apparent reduction in airway distensibility by measuring bronchial dimensions (visualized by coating with tantalum dust) in human post-mortem lungs as transpulmonary pressure and lung volume were increased. Small airways were more distensible than large airways in young normal lungs; in older normal lungs airway distensibility was reduced and differences between small and large airways were not significant. In patients dying of chronic airflow obstruction, airway distensibility was in general similar to that in older normals, the sole exception being that airways of less than 1 mm diameter showed very little change in diameter with lung volume in severely emphysematous lungs. The results suggest that loss of parallel airways, rather than increased stiffness of surviving airways, is the major cause of the lack of change in airways conductance with lung inflation.

CHRONIC LUNG DISEASE IN NEW GUINEA HIGHLANDERS

H. R. ANDERSON The New Guinea Highlanders have been thought to suffer from chronic lung disease as a result of repeated infections and exposure to wood smoke in the houses. A prevalence study of chronic lung disease has been performed in over 2,000 people comprising the total population of 12 villages situated at 6,000 feet in the Eastern Highlands.

Despite difficulties in communication, a simple questionnaire proved to be practical and was subsequently validated by objective evidence of lung disease.

Spirometry was done, and in those with no clinical evidence of lung disease values were the same as for European populations. There was no significant difference between smokers and non-smokers.

The most common abnormality was a positive loose cough sign and this occurred in 30 to 50% of adults. This sign had many practical advantages and correlated with other criteria of lung disease. It was the only abnormality that was associated with smoking. This sign may be useful for comparing the prevalence of chronic lung disease in people of different cultures.

SHOCK LUNG

JOHN F. MURRAY 'Shock lung' is defined as a clinical-physiological syndrome—an episode of hypotension (from any cause), a latent period without pulmonary manifestations, and a period of progressive dyspnoea, radiographic changes, hypoxia, and reductions in compliance. If the syndrome becomes fully developed, the mortality rate is 70 to 80%. Histological examination reveals intense interstitial and alveolar oedema, and occasional hyaline membranes. The earliest lesion has not been completely characterized but presumably entails permeability of the pulmonary capillary endothelium that leads to interstitial fluid accumulation.

The 'newness' of shock lung is directly attributable to improvements in medical and surgical care that allow patients to survive the early phases of severe shock and thereby to develop late complications.

No single factor has been established as the cause of shock lung, but many intrinsic pathways of potential lung damage have been identified—vasoactive

substances, toxins, microemboli, and myocardial failure. Extrinsic influences—overhydration, oxygen, and infection—undoubtedly compound the disturbance. Treatment should be primarily preventive, including prompt correction of hypotension, alleviation of hypoxia, *early* use of ventilatory support, and prevention of atelectasis with end expiratory pressure. Extracorporeal oxygenation has had limited success in severe cases of shock lung.

EXPERIENCE WITH THE BRONCHIAL FIBRESCOPE

S. F. STEPHENSON The bronchial fibrescope gives a greater range of vision than the conventional bronchoscope and therefore increases the diagnostic rate in bronchial carcinoma. In 200 cases of lung cancer the rigid bronchoscope provided the diagnosis in 58% while the fibrescope increased this figure to about 83%.

Considerable practice is needed to get good results with this instrument. Although it can be passed through an endotracheal tube, the simplest technique is first to pass a rigid bronchoscope under general anaesthesia, and then, if necessary, to pass the fibrescope down the bronchoscope. The fibrescope is normally used only if conventional bronchoscopy is negative.

Fibroscopy under *x*-ray control, using an image intensifier, may enable brush biopsies to be taken from peripheral lesions beyond the range of vision of the fibrescope.

PERIPHERAL TEMPERATURE CHANGES AFTER OPEN-HEART SURGERY

H. R. MATTHEWS, C. C. EVANS, and J. B. MEADE All patients at the conclusion of open-heart surgery (OHS) show some degree of peripheral vasoconstriction which persists for a variable time until vasodilatation occurs and normal skin perfusion is restored.

In over 150 consecutive OHS patients we have accurately recorded this 'warm-up pattern' by means of a skin temperature thermometer attached to the foot. Analysis of the results in 82 'normals' shows a remarkably consistent warm-up pattern which is unaffected by the duration or nature of operation or the nature of the primary cardiac lesion. The reproducibility of this event has enabled us to construct a nomogram which predicts the limits of time within which a patient who is recovering normally should warm up, and thus also to recognize that patients whose vasoconstriction persists beyond these limits are behaving pathologically and require prompt diagnosis and treatment of the underlying cause.

This nomogram is now being used clinically in the care of all patients after OHS, and in this paper evidence is presented to show (1) the basis on which it has been constructed, (2) that it permits the early recognition of a prolonged or abnormal degree of shock, and (3) that the effects of any treatment designed to reverse the persistent shock state can be accurately assessed and, if necessary, improved.

CARDIOPULMONARY FUNCTION FOLLOWING ACUTE PULMONARY THROMBO-EMBOLIC EPISODES IN MAN

W. J. WINDEBANK, D. CITRIN, G. STOCKDILL, and F. MORAN Details of the functional disturbances of the heart and lungs following 105 acute pulmonary thrombo-embolic episodes in man are described. In all patients the diagnosis of pulmonary thrombo-embolism was established by pulmonary angiography.

Pulmonary hypertension was demonstrated in the majority. In addition several had an increased indirect left atrial pressure (pulmonary wedge pressure) which fell with treatment of the pulmonary embolus. This latter abnormality gives rise to clinical syndromes suggesting left heart dysfunction and these are rarely recognized as being due to pulmonary embolism.

Most of these patients had significant arterial hypoxia and all of them had a right-to-left shunt of blood. This has not been well documented in man although it has been observed frequently in animal experiments. Although a low partial pressure of arterial carbon dioxide is frequently associated with pulmonary emboli, many of our cases had a normal and two had increased arterial carbon dioxide tension. The arterial-alveolar carbon dioxide tension difference is a measure of excessive alveolar ventilation in relation to perfusion. This value was normal in one-third of our patients, suggesting that there are efficient compensatory mechanisms for reducing ventilation to embolized regions. Studies of ventilation and gas exchange show a wide spectrum of abnormalities that may take up to 12 months to return to normal.

Possible explanations of the functional abnormalities are discussed and related to the clinical syndromes produced by pulmonary thrombo-embolism.

USE OF ^{75}Se-SELENOMETHIONINE IN THE DIAGNOSIS OF LUNG CANCER

MAIR CRITCHLEY, H. J. TESTA and T. B. STRETTON ^{75}Se-selenomethionine is derived by substitution of selenium for the sulphur atom in the methionine molecule. It has the biological and metabolic properties of the natural amino acid and after intravenous injection it is rapidly removed from the blood and incorporated into newly synthesized protein. Preliminary investigations with this radiopharmaceutical suggest its potential value in the differential diagnosis of lung cancer. A rectilinear lung scan is first performed after intravenous injection of ^{99m}Technetium-labelled macroaggregated albumin, in which the pulmonary lesion appears as a 'cold area'. This is followed by injection of ^{75}Se-selenomethionine and a further scan is performed one hour later, particular attention being paid to the 'cold area' recorded previously. Patients with primary bronchogenic carcinoma showed increased uptake of ^{75}Se-selenomethionine in the pulmonary lesion whereas patients with benign lesions and secondary carcinomas showed no such uptake of the radioactive material.

Our observations to date on some 30 patients will be described. The technique can be completed 2½

hours after the initial injection and it appears to have a place in the investigation of 'coin lesions' in the lungs.

BRONCHIAL ADENOMA—A REVIEW OF THE LAST 18 YEARS AT THE BROMPTON HOSPITAL

R. A. M. LAWSON, K. HINSON, G. HURLEY and S. C. LENNOX Continued uncertainty about the prognosis of bronchial adenoma led to a review of the experience of the condition in the Brompton Hospital.

Of 72 patients seen between January 1955 and December 1972, 39 were women and 33 men. Their ages ranged from 9 to 73 years and the average age was 45 years.

The commonest presenting symptoms were haemoptysis, cough and sputum, and repeated chest infections. A positive biopsy was obtained at bronchoscopy in 35 cases but in five of these the biopsy was originally reported as carcinoma, of oat-cell type in four.

Two patients were treated by endoscopic removal, six by bronchotomy, three of the latter requiring further surgery. Two patients underwent wedge resection; one died on admission and the remaining 61 had either lobectomy, sleeve resection or pneumonectomy.

The histology of the resected specimens has been reviewed and they have been classified as carcinoids (67), cylindromas (2), muco-epidermoid tumours (1), and adenomas of mucous glands (2).

Although the follow-up is not yet complete it appears that the prognosis of the carcinoid type can be accurately assessed from histological examination of the operative specimen. Thus in seven patients with either metastases or atypical features the four deaths are all related to the condition, whereas in the remaining 60 considered to be classical there have been no related deaths.

HORMONE PRODUCTION BY LUNG TUMOURS

LESLEY H. REES, J. G. RATCLIFFE, GLENYS BLOOMFIELD and G. M. REES The production of ACTH and other hormones by lung tumours is much more common than is recognized clinically. Significant amounts of immunoreactive and bioactive ACTH were demonstrated in a series of unselected lung tumours (carcinomas and adenomas) from patients without clinical evidence of ectopic ACTH secretion (controls). Furthermore, the control tumour ACTH levels were often similar to those found in oat-cell carcinoma of the bronchus associated with the ectopic ACTH syndrome, and greater than those measured in macroscopically normal lung tissue taken from the same patient. The clinical recognition of excess hormone production in patients with lung tumours may be difficult when the metabolic abnormalities are mild and when the tumour produces multiple hormones. Thus one patient with an oat-cell lung tumour had only mild clinical evidence of ectopic ACTH secretion whereas the tumour maintained *in vitro* secreted MSH, arginine vasopressin and neurophysin in addition to ACTH.

We conclude that the ectopic production of ACTH and other hormones occurs frequently in lung tumours and may, in part, account for the poor prognosis in some of these patients. The full clinical value of these observations has yet to be determined.

ENVIRONMENTAL HAZARDS

Opportunist Mycobacterial Pulmonary Infections and Dust Exposure

H. E. THOMAS A preliminary report is given on the results of a co-operative study into the epidemiology of opportunist mycobacterial pulmonary infection in England and Wales. The industrial and non-industrial dust exposures and smoking habits of those whose pulmonary disease was due to opportunist infection were compared with those of a contrast group of the same age and sex whose infection was due to *Mycobacterium tuberculosis*.

Of 70 males, 53 were found to be infected with *Mycobacterium kansasii*. Only eight females were discovered in the survey of whom five were infected with *Mycobacterium kansasii*.

There was no suggestion of differences between the index and contrast groups in various indices of past exposure, dust exposure within five years before diagnosis or a history of coal mining; but a significantly higher proportion of the *Mycobacterium kansasii* group had had dust exposure continuing up to the time of diagnosis. These findings may have direct implications about the aetiology of *Mycobacterium kansasii* infections.

Respiratory Disease while Harvesting Grain

C. S. DARKE and J. LACEY The inhalation of grain dust during work on the combine harvester and in the vicinity of the grain drier has led to reactions resembling extrinsic asthma. Men affected in this way have had to come off this work since ordinary effort caused considerable breathlessness and continued exposure merely aggravates the condition.

The paper presents factual data of 78 individuals who farmed in Lincolnshire. Eighteen farmers (23%) complained of cough, wheezing, and a little mucoid sputum when exposed to the dust, and the symptoms persisted throughout the harvest period.

Surveys were carried out during the three years 1970–72. They included responses to the MRC Questionnaire on Bronchitis, smoking habits, family history of allergic disorders, and tests of respiratory function before, during, and after each harvest. Chest radiographs, skin testing to the routine agents and other relevant antigens as well as serological tests were carried out.

In co-operation with the Rothamsted Agricultural Research Station (Dr. J. Lacey) samples of the atmosphere surrounding the drivers of the combine harvester and within the grain drier shed were examined. A heavy pollution was noted.

Possible damage to the farming industry from this cause is discussed and observations are made regarding prevention.

Monitoring an Asbestos Spray Process

J. W. SKIDMORE and J. S. P. JONES Observations that a large number of urban dwellers have some asbestos fibres in their lungs stimulated research to determine the source of airborne fibres to which the general public might be exposed. The spraying of asbestos onto structural steelwork for fire protection was considered a probable source. Monitoring of the dust cloud produced when the latest method of spraying was used has shown that, while a high degree of dust suppression can be achieved during spraying, unprotected workers coming on site subsequently may be exposed to asbestos clouds.

Skin Tests and Clinical Features of Asthma

P. FORGACS A co-operative study of the serum immunoglobulins in asthma was carried out in 1972 by the Research Committee of the BTTA and the Department of Clinical Immunology at the Institute of Diseases of the Chest. Patients were classified into groups 0, 1, 2, and 3+ according to the number of positive reactions to prick tests with 23 allergens. One hundred and twenty-three patients were recruited from 24 chest clinics in the United Kingdom. The intake was continuously regulated to arrive at an even distribution between the sexes, age groups 20–29, 30–39, and 40–49 years, and the four skin test groups.

The clinical data, recorded on questionnaires, were studied in relation to the results of skin and nasal tests. The report includes a comparison of the incidence of clinical features in the four skin test groups and a study of the correlation between a history of pollen or house dust sensitivity and the skin and nasal tests with the corresponding allergens.

Immunological Responses in Farmer's Lung

G. BOYD, D. PARRATT, and K. H. NIELSEN Using an indirect fluorescent antibody test (Parratt and Peel, 1972) and a specific radio-immunoassay technique (Nielsen and Parratt, 1973), antibodies to *Micropolyspora faeni* were studied in sera from patients with farmer's lung.

These methods afforded quantitation of the antibody responses in patients suffering from acute and chronic farmer's lung. Their relationship to clinical symptoms was studied in a group of 40 farmers and in a small group; only the changing levels of antibodies were followed for over one year. There was an excellent correlation between clinical symptoms and raised levels of antibodies to *Micropolyspora faeni* among the farmers studied and these methods proved much more sensitive than conventional gel diffusion precipitin tests in confirming the clinical diagnosis. They also enabled changes in antibody levels to be monitored over periods of increased exposure in the winter months and during recovery from acute clinical episodes of farmer's lung.

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