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PREFACE

The need to hear and record the patient's history, and to elicit and interpret physical signs remains paramount in medical practice. In an era of increasing medical litigation, accurate records of history and examination in hospital and general practice serve to strengthen the defence of the doctor. Recent changes in medical education are directed to problem-solving techniques, which rely on evidence-based medicine that require access to a computer. However, we still believe that comprehensive texts, illustrated with contemporary disease states, will remain a valuable source of clinical instruction for students and qualified medical staff.

A lot of tables have been introduced for ease of learning and understanding, while photographs — some black and white, some in colour will help to understand descriptions of practical skills and physical signs. We are grateful to all the patients illustrated who have consented to their photographs being published in this edition.

The authors wish to thank the many colleagues and friends who have been instrumental in the preparation of this book. To the staffs of the Chair and Clinic of internal diseases propedeutics, Sechenov Moscow medical academy goes our gratitude for their assistance in preparing illustrations used in this book. We express our special thanks to doctors Maria Nadinskaya MD, Oxana Drapkina MD PhD, Julia Shulpekova MD, Oleg Shifrin MD, Alexey Lapshin MD, Chavar Pavlov MD, Mikhail Kon'kov, Natalya Kokina MD, Marina Mayevskaya MD, Alexander Rumyantsev, Yan Libet, Larisa Sheptulina.

We have been interested for some years in the difficulties encountered by medical students in understanding these fundamental principles with regard to physical examination. By whatever method they are taught, the apparent ease with which these principles are forgotten (or not learned) impels serious thought as to the efficacy of teaching methods. It is indeed a source of wonder that students will memorize and retain facts concerning difficult differential diagnosis, multiple details with regard to clinical pictures and therapeutics and yet are unable, beyond the period of formal examination, to retain the fundamental facts about physical examination.

We believe it wrong to demand that students commit to memory the physical findings, let us say, of lobar pneumonia or mitral stenosis, because an understanding of the pathologic physiology will, of necessity, make clear the findings that must be present. Conversely, an understanding of the disturbed physiology, on the basis of the findings which present themselves on examination, should help the student in determining the pathology present.

Although laboratory procedures, such as multiple imaging or chemistry studies, etc., are frequently necessary and sometimes essential for accurate diagnosis, much can nevertheless be accomplished in their absence by the use of the older established procedures of inspection, palpation, percussion and auscultation, if these methods are adequately understood and carefully practiced. Today, just as with our medical forefathers, the maxim that «the whole art of medicine is in observation» is still true. A carefully taken, detailed history and careful physical examination utilizing the senses of sight, hearing and touch will ensure correct diagnosis in the great majority of cases.

INTRODUCTION

It is natural for the student to be anxious when first approaching a patient. He fears that sick people will not welcome a nervous and clumsy beginner and that he can be of no help to them. This is the time for him to remember that many patients find comfort in the knowledge that their own suffering may serve, through the observations of students, to ease the burden of those who follow, perhaps even their own children. But the student can also be a messenger between the fearful patient and the awesome doctor. Time and again, students have discovered facts vital to diagnosis or management that had previously been withheld because of the patient's fear, the doctor's haste or the forbidding retinue that accompanies the physician on his round. The student should approach his patient with humility and gratitude, but also with quiet confidence in the responsibility which will be his for the remainder of his life.

Clinical medicine is above all a matter of communication between people, and the quality of the student's relationship with patients and colleagues could decide his success or failure as a physician. Sometimes even facial expression, tone of voice and manner of movement can affect the ability to elicit the patient's story and to lead him back to health. For it is in such outward signs that we display those attitudes of mind, which may act as a barrier to communication with others. In the presence of his patient the student must master his emotions, clear his mind of distracting thoughts and avoid all appearances of haste. His manner should be alert and attentive, yet gentle and sympathetic. Without these qualities, he will neither obtain the facts necessary for diagnosis nor effectively convey the advice essential to management. Before confronting the patient, the student should also anticipate, as far as possible, the probable attitude of the particular patient he has come to see. He must be ready for the resigned and sometimes resentful manner of the patient with chronic incurable disease, the frightened questioning from those with recent alarming symptoms, the desperate pleading of the patient in acute pain, the unresponsiveness of the seriously ill. He must also adapt himself to the patient's ethnic, social, educational and intellectual background and use forms of speech which he can understand.

Whether in a hospital ward or the patient's home, it is wise to inquire if patient is available for examination. If possible, patients should not be disturbed during meal times, when they have visitors or while they are undergoing diagnostic or therapeutic procedures. Before attempting to obtain a formal clinical history, the student should introduce himself and ask if he may put some questions about the illness which took the patient to his doctor. He should then make sure that the patient is as free as possible of any immediate physical or mental discomfort. Except in urgent cases, it is preferable to postpone the interview rather than try to elicit the history of a patient who is drowsy from drugs, or feeling sick. Usually it is reasonable first to talk to the patient's doctor who may say whether, because of the patient's present mental or physical state, any special precautions are needed. The student can thus be forewarned of language difficulty, emotional traits or any defects of memory, concentration, hearing or speech which might call for some modification of his approach.

The field of diagnosis has grown so large and so complex that the student is bewildered by the many procedures he must learn in order to arrive at a correct diagnosis. However, a bird's eye view of this complex field shows that the various diagnostic procedures can be classified into three groups: subjective symptoms; physical signs; laboratory and instrumental tests. The first group concerns itself with a careful and detailed interviewing and history taking. The second is studied by complete and thorough physical examination. The technique of this and its diagnostic value will comprise the important part of this manual. The third consists of the various and ever-increasing number of laboratory procedures which aid in evaluating the facts obtained from the history and physical examination.

A carefully written record of every case, including all the data collected by the before-mentioned diagnostic procedures plus treatment and results, is essential. Subsequent records should be continued, and progress notes should include all changes and additions in history, physical signs, laboratory findings and treatments. Such a record not only assists in the care of the individual case but constitutes an important basis for clinical research and thus enables the physician to benefit himself and the profession by his experience.

CHAPTER 1
THE RESPIRATORY SYSTEM

History

As with any other system a comprehensive history, comprising a characterization of each system, is essential for synthesizing a diagnosis when faced with respiratory problem. A detailed **occupational**, **social** and **drug history** are of special importance in evaluating respiratory symptoms. There are six main presenting symptoms which point to an underlying respiratory disorder (Table 1).

Table 1. Respiratory symptoms

• Cough
• Sputum
• Breathlessness
• Chest pain
• Haemoptysis
• Wheeze

Cough

Cough is a protective reflex and is the result of an effort to expel any accumulated secretions or a foreign substance in the respiratory passages, by means of a release of increased intrathoracic pressure through an open glottis. As such, cough is highly specific to respiratory disorders but it has a low diagnostic sensitivity. However, it should not be dismissed as a «normal winter cough» or a «smoker's usual cough» in anyone. Patient should be asked about its onset, duration, the time of occurrence, any change in frequency and severity, and about the associated expectoration.

As the production of cough depends on an increase in intrathoracic pressure with the glottis closed and then its release through the open glottis, inflammation of the larynx gives the cough a harsh, barking quality. If one of the vocal cords is paralysed the cough loses its explosive character and becomes like a uniform low of cattle (bovine cough).

A bout of coughing may be precipitated by inhalation of cold air, dust or toxic fumes. Recurrent nocturnal cough may suggest either nasopharyngeal dripping or gastroesophageal regurgitation. It is commoner in older people and may be associated with oesophageal stricture, neurological swallowing problems and cardiac failure.

Cough originating in the upper respiratory passages (pharynx, larynx, trachea) tends to be harsh, painful and loose whereas that due to secretions in the small airways comes in paroxysms and culminates in expectoration. In bronchiectasia, cough is characteristically loose and long bouts occur in the mornings when patients bring up large quantities of purulent sputum. Persistent cough is an important feature of a variety of pulmonary disorders including cystic fibrosis, bronchiectasia, pulmonary oedema, sarcoidosis, pulmonary tuberculosis, and pulmonary fibrosis.

Sputum

Information should be obtained about its quantity (an eggcupful, teacupful, etc.), colour (white, grey, black, pink, yellow or green), viscosity (serous or tacky), taste and odour (Table 2).

Table 2. Characteristics of sputum

Sputum	Condition
Mucoid, excessive quantities	Chronic bronchitis
Mucopurulent or purulent (yellow or green)	Infection — acute or chronic bronchitis
Excessive in early mornings, or at change of posture, purulent	Bronchiectasia
Black	Cigarette or atmospheric smoke, coal-miner's sputum
Pink, frothy	Acute pulmonary oedema
Rusty	Lobar pneumonia
Blood-stained	Acute bronchitis, tuberculosis, neoplasia
Viscous with plugs	Asthmatic pulmonary eosinophilia

A change of colour from white to green or yellow suggests the onset of infections in patients with chronic bronchitis. A pink and frothy sputum associated with breathlessness is commonly encountered in pulmonary oedema.

Breathlessness

Breathlessness, or dyspnoea, may be simply a subjective uncomfortable awareness of breathing (from any cause), but in cardiorespiratory disorders it is key symptom of the cause, an index of severity, and an indicator of progression of the underlying disease. Some important respiratory causes of dyspnoea are given in Table 3.

Bearing these causes in mind, ask the patient about the onset (when he really became aware of breathlessness), its severity (how much he could do before becoming breathless), the present state (what activities cause breathlessness now), and about the associated symptoms (e.g. cough, haemoptysis, chest pain, etc.).

Table 3. Some respiratory causes of breathlessness

Site	Lesion
• Upper respiratory passages	• Pharyngeal / laryngeal / tracheal obstruction
• Major bronchi	• Chronic bronchitis, bronchiectasia
• Lung parenchyma	• Asthma, pneumonia, allergic alveolitis, sarcoidosis, fibrosis, respiratory distress syndrome, malignant disorders
• Pleura and chest wall	• Pneumothorax, pleural effusion, tumours, kyphoscoliosis, ankylosing spondylitis, neuromuscular disorders

Dyspnoea may be severe and present at rest as in pulmonary oedema and asthma; in both cases it is episodic with normal intervals in between the paroxysms. In chronic obstructive airways disease, many patients get used to slowly progressive respiratory disability and only become aware of breathlessness when disease is advanced with considerable structural damage.

Chest pain

Retrosternal pain, worse on coughing but unaffected by exercise, may be caused by acute tracheitis and by inflammation, emphysema or tumours involving the mediastinum. A pleuritic pain (a sharp pain arising in the parietal pleura or chest wall and aggravated by inspiration) is of particular importance in pointing to those respiratory disorders which involve the pleura (e.g. pneumonia, pulmonary infarction, pneumothorax, primary inflammation, infection or malignant infiltration of the pleura).

Haemoptysis

A history of haemoptysis should not be ignored without a proper clinical assessment and may require further investigations. Among the diseases producing blood-stained sputum are acute and chronic bronchitis, pulmonary oedema, mitral stenosis, pneumonia, pulmonary infarction, pulmonary tuberculosis and carcinoma. Frank haemoptysis may be seen in any of those conditions. Recurrent haemoptysis may be seen in pulmonary tuberculosis, adenoma, mitral stenosis and apical fibrosis with aspergillosis.

Wheeze

Wheeze is a high-pitched, musical noise and it can be readily demonstrated to the patient by increasing the intrathoracic pressure and then forcing the air through voluntarily narrowed upper air passages. In disease it can be caused by the high velocity of expiration through the narrowed, small airways (bronchitis, asthma).

In addition to a standard systems review, enquiries should be made about some common disorders which also involve the respiratory system. Some of these together with their pulmonary complications are given in Table 4.

Table 4. Some systemic disorders with pulmonary complications

Disease	Pulmonary complication
• Rheumatoid arthritis	• Pleural effusion, pulmonary nodules and fibrosis
• Systemic lupus erythematosus	• Pleurisy and effusion, pulmonary infarction, pulmonary hypertension
• Systemic sclerosis	• Pulmonary fibrosis, aspiration pneumonia
• Sjögren's syndrome	• Pulmonary fibrosis, pneumonia
• Ankylosing spondylitis	• Upper lobe fibrosis
• Behcet's syndrome	• Pulmonary arteritis, infarcts
• Coeliac disease	• Interstitial lung disease
• Neuromuscular disorders	• Chronic respiratory failure

Family history

Ask if any of the close relatives has had asthma, hay fever, eczema or rhinitis. A family history of these atopic conditions is found in a significant proportion of asthmatic patients. A variety of genetically determined conditions have a significant pulmonary component. For example, pulmonary fibrosis occurs in association with some autosomal recessive (cystic fibrosis, α_1-antitrypsin deficiency) and autosomal dominant disorders (Marfan's syndrome, neurofibromatosis, tuberculous sclerosis). Patients with sickle-cell disease and Ehlers-Danlos syndrome are prone to respiratory infections.

A detailed **occupational** and **environmental** history should be obtained and enquiries should be made about present and past employment (miner, stonemason, farmworker, soldier, baker, etc.), and about exposure to chemicals, inorganic and organic dusts and toxic fumes. It is important to record the degree and duration of exposure, and its temporal relationship to the onset of symptoms. Patients should be asked whether they have pets and about any other factors in the environment which they think may cause symptoms (e.g. hay, dust, feathers, pollen, etc.)

Social history including the details of home circumstances, both structural (cold, damp or dusty) and personal (stress, conflicts) should be recorded. People living downwards from an asbestos-polluted environment may develop clinical asbestosis or even mesothelioma. Patients should be asked about their past and present smoking habits, duration of smoking, and about the number of cigarettes used per day, of the quantity of tobacco. Chronic bronchitis and emphysema are uncommon among non-smokers.

A full **drug history** should be obtained including the information about those drugs that are available without a prescription (e.g. aspirin-containing drugs). Aspirin may cause asthma and a variety of non-steroid anti-inflammatory drugs may cause or worsen bronchospasm. Beta-blockers may precipitate an acute attack of asthma. Many drugs, such as nitrofurantoin and amiodarone, and cytotoxic drugs cause pulmonary fibrosis.

General inspection

On general examination, there may be clues to the underlying disease:

Cachexia may occur in malignant disease, and in severe chronic lung disease, including fibrosis, infection and emphysema. Cachexia may occur in a number of severe disorders, including chronic lung disease such as pulmonary fibrosis, tuberculosis and emphysema, malignant disease, including bronchial carcinoma, and systemic infection, especially with HIV («slim disease»). Note the obvious signs of weight loss, fever (Fig. 1), with widespread muscle and soft-tissues wasting.

Cyanosis — best seen in the lips, tongue, buccal mucosa and fingers — indicates significant desaturation of circulating haemoglobin. Cyanosis is a fundamental sign of cardiorespiratory disorders and suggests capillary oxygen desaturation of 85% or lower.

A plethoric appearance may result from polycythaemia most commonly secondary to chronic hypoxia in lung disease.

A herpetic eruption on and around the lips is sometimes seen in a patient with a respiratory infection.

Coal dust tattoos may be seen on the face, though these are more often seen on the arms, as an occupational legacy in a patient with pulmonary fibrosis.

You may see small reddish papules of sarcoid infiltration which sometimes coalesce to form a dense induration called *lupus pernio*. *Lupus vulgaris* is a cutaneous manifestation of tuberculosis. In both cases there is reddish induration of the skin but the lesion of *lupus vulgaris* has a transparent appearance and there may be associated scarring which does not occur in *lupus pernio*.

Nasal polyps frequently occur in patients with an atopic background and in those with cystic fibrosis.

Eczema is often found in conjugation with hay fever and asthma.

The oscillations of the jugular venous pulse are difficult to interpret in patients with chronic airways obstruction who generate a high intrathoracic pressure to drive the air out through the narrowed bronchi. However, static engorgement of the neck veins is an important sign of obstruction of the superior vena cava, usually caused by mediastinal malignancy.

«Nicotine» stained fingers occur in heavy smokers, and typical pigmented scars may occur in coal miners; in association with finger clubbing both signs have an ominous significance, suggesting underlying bronchial carcinoma, pulmonary fibrosis, bronchiectasia or chronic sepsis.

Finger clubbing is frequently present in a number of conditions (Table 5), especially bronchial carcino-

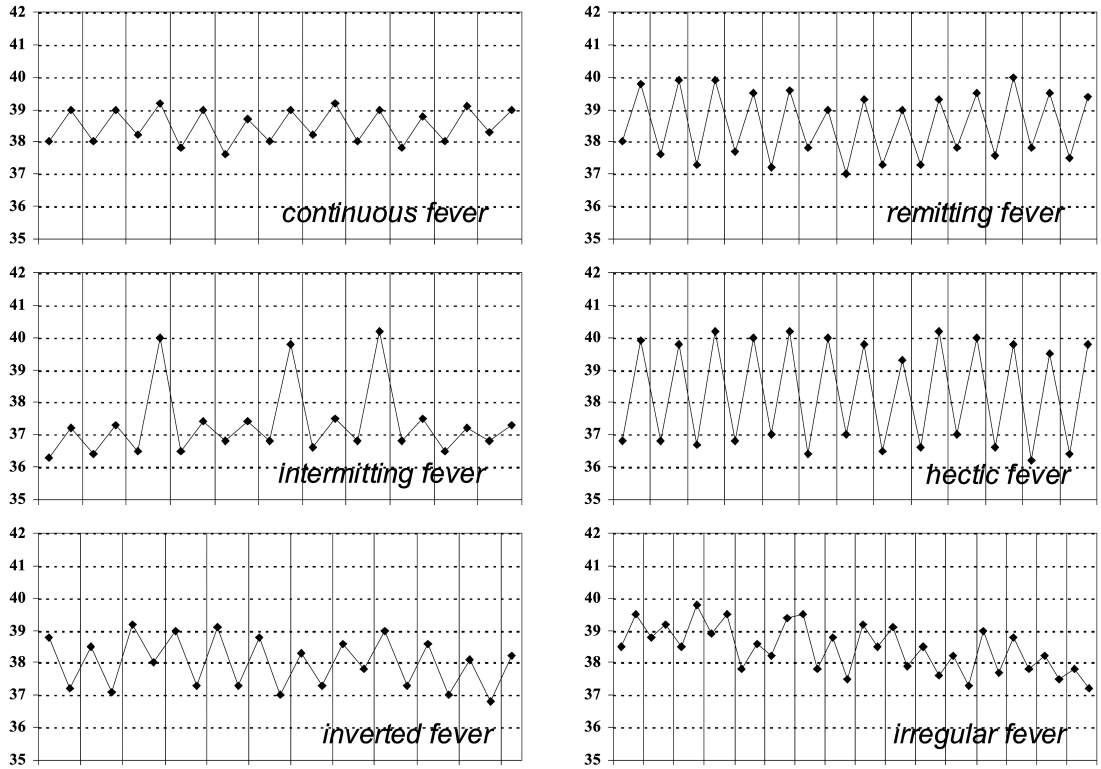

Fig. 1. Basic types of fever.

Table 5. Some causes of finger clubbing

• Hereditary	
• Pulmonary and thoracic	Bronchogenic carcinoma, metastatic carcinoma, fibrosing alveolitis, bronchiectasia, cystic fibrosis, pulmonary arteriovenous fistula, mesothelioma
• Cardiac	Congenital right-to-left shunt, infective endocarditis
• Gastrointestinal	Hepatic cirrhosis, inflammatory bowel disease

ma (occasionally with a pleural fibrinoma), and in those with chronic purulent conditions such as bronchiectasia, lung abscess and empyema (Fig. 2).

The short and stunted, excessively curved, and greenish yellow nails of yellow nail syndrome may be seen in association with a pleural effusion or pulmonary neoplasm. Because of the rarity of this syndrome, the abnormal nails are easily overlooked.

Fig. 2. Finger clubbing in a patient with bronchiectasia.

Hands should also be examined for the sweating, tremor or twitching associated with hypercapnia. In severe **hypercapnoic respiratory failure**, the patient may be confused and there may be a **flapping tremor** (inability to sustain extension at the wrist), which is often seen in hepatic failure. The survey should be completed by looking at the chest, abdomen and legs for any swellings or discoloration.

Examination of the chest

Inspection

After the general inspection of the patient, attention should be directed next to the chest and spine, looking for the shape of the ribcage and the presence of any deformities. Deformities of the ribcage may be congenital or may be caused by recurrent infections, cardiac enlargement, or deficiency states during early childhood.

The effects of vitamin D deficiency on a growing skeleton may leave a deep groove passing outwards from the xiphisternum, also known as Harrison's sulcus.

Cystic fibrosis is a common cause of recurrent respiratory infections leading to chest wall deformity.

You should bear these in mind when interpreting your findings, because a chest wall deformity may alter the normal anatomical position of intrathoracic organs (e.g. location of the apex beat).

The commonest deformities of the chest and spine are **scoliosis**, **kyphosis**, and a combination of the two, **kyphoscoliosis** (Fig. 3). **Kyphosis** results in anterior concavity of the thoracic spine and thereby leads to shortening of the chest. Kyphosis is frequently seen in elderly people with osteoporosis, **chronic obstructive airways disease**, and sometimes in younger men with **ankylosing spondylitis**.

These deformities make the ribcage unyielding and in severe cases lead to respiratory failure.

In the so-called barrel-shaped chest the anteroposterior diameter of the chest is increased and the ribs are more flatly set than usual, the sternum becomes prominent anteriorly and the manubrium extends upwards in the neck (Fig. 4).

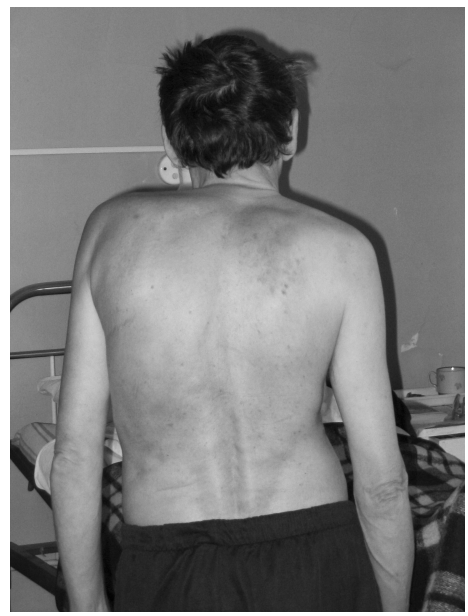

Fig. 3. Kyphoscoliotic chest.

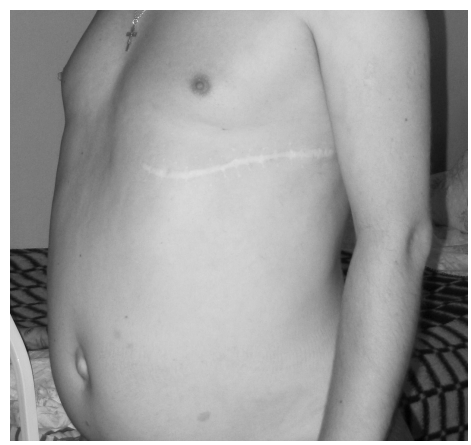

Fig. 4. Hyperinflated chest.

The chest at rest looks as it would at the end of full inspiration, and any further inspiration from this position is achieved by an upward movement of the ribcage effected by the accessory respiratory and abdominal muscles (Fig. 5).

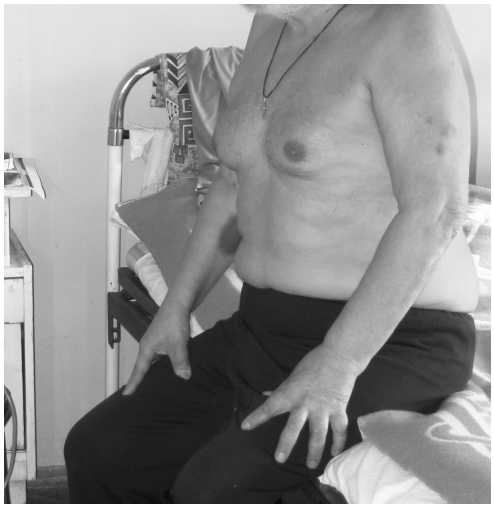

Fig. 5. Posture of the patient in severe dyspnea («forced position»).

These changes of hyperinflation are often associated with emphysema. In severe cases the patient may sit at the edge of the bed with raised shoulders in an effort to increase the intrathoracic capacity for the lungs to expand further during inspiration. A more acceptable and polite term for barrel-shaped chest is **hyperinflated chest**.

A note should be made of any scars of previous operations which may have a link with the present problem.

Thoracoplasty scars are seen in older patients who had this operation done for tuberculosis before effective chemotherapy became available. This procedure constitutes removal of some ribs and thereby allows the underlying part of the lung collapse and «rest». The trachea may be deviated to the site of the thoracoplasty and there may be bronchial breathing audible over the collapsed area.

Look at the chest wall for any skin lesions or swellings such as **gynaecomastia** (Fig. 6). Sometimes pulmonary symptoms may be related to the intrathoracic metastases of breast cancer (Fig. 7).

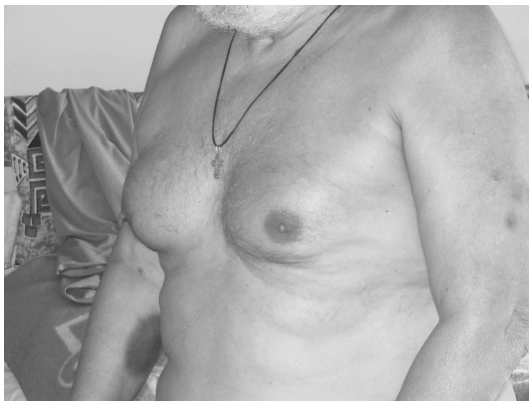

Fig. 6. Gynaecomastia.

Chest wall movements should be observed carefully for their direction (e.g. mainly outwards or upwards) and for the symmetry of the two sides. Normally, thoracic expansion is a symmetrical process. If respiratory differences are detected, even when slight, they indicate definite disease on the side of the lagging respiratory excursion. Abnormalities in thoracic expansion may be unilateral or bilateral, or may be limited to certain definite areas of the thorax. Bilateral general increase in expansion may be observed physiologically after active physical effort, particularly in persons not accustomed to such effort. Pathologically, it occurs during paroxysms of bronchial asthma which may lead to emphysema. Bilateral general decrease is usually seen in the small chests of elderly patients with atrophic emphysema. A similar decrease may occur in disease of the chest wall, such as intercostal muscle paralysis, and disease of the lungs or pleura, such as bilateral pneumonia, tuberculosis or pleurisy with effusion. The pain of diaphragmatic pleurisy and intercostal neuralgia may also cause a general diminution in respiratory excursion. Unilateral diminution or delayed expansion is tuberculosis of the lungs, but it may also result from pneumonia, pleuritis with its attendant pain, pleural effusion or pneumothorax. In chronic cases, such inequalities are generally due to local adhesions.

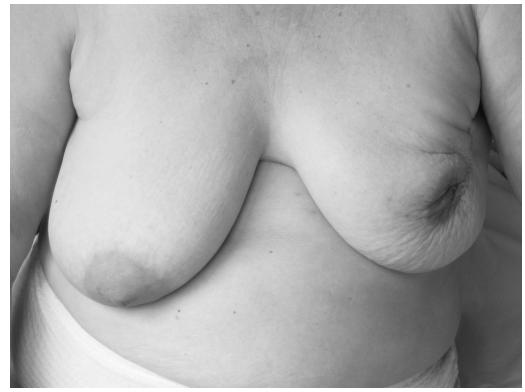

Fig. 7. Cancer of the left breast.

The lower rib spaces should be seen to bulge during inspiration, that occurs in chronic obstructive airways disease in which the diaphragms are flat and low and the high negative pressure causes intercostal recession.

Breathing

During the process of inspection you should try to listen carefully to the patient's breathing, since the information so gained will be vital in the final synthesis of the diagnosis. The bell of the stethoscope, placed in front of the patient's mouth, can be useful in listening to both phases of the respiration and any accompanying noises.