of the Abortion Act, not only on religious grounds. Only 2% of terminations are carried out privately. The statistics issued by the Scottish Home and Health Department for 1970⁸ show that, for every termination carried out in Scotland, 1.71 are done in England and Wales. The figures for the western region of Scotland are the lowest in Scotland; for each therapeutic abortion there, 2.34 were done in England and Wales. These figures involve large numbers. For example, if in 1970 the rates for the rest of Scotland had been applied to the Glasgow area there would have been a total of 1,840 additional abortions during the year.

Conclusions

The "sticking point" in the abortion decision and the most controversial issue seems to be the single, abandoned, girl. This group accounts for the refusals, which explains the discrepancies between the low figures for the region and the higher figures for the rest of the country, and yet it is the group (or part of it) which remains in a series where 85% of requests were granted.⁹ It is the group most often terminated privately.⁹

The findings in this group show that, while social problems preponderate, the decisions are made on clinical psychiatric grounds—that is, whatever the severity of the social problems the patient is expected to show a severe reaction to them before termination is advised. While psychiatric sequelae are uncommon in terminated and untermiated patients they are marginally more frequent in those refused.

Some tentative conclusions about the operation of the Act are possible. Firstly, despite careful attempts at informed decision-making the bulk of women seeking an abortion achieve their end if not in one centre, then in another; if not under the N.H.S., then privately. Secondly, even when psychiatrists are making the assessment, social factors at best are given only secondary importance in reaching decisions, and at worst play no part at all. Thirdly, the hard core of dissent is the single girl. Probably this group provokes the most moralistic response from the profession.

Lastly, the study confirms the sad state of contraceptive practice among married and single women and older and younger women, both before and after abortion or unwanted pregnancy. Evidence from other sources¹⁰ suggests that this is unlikely to be remedied, and the number of unwanted pregnancies and hence of abortions is unlikely to decrease in future.

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Medicine in Old Age

Endocrine Disorders in the Elderly

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Any endocrine abnormality except those affecting menstruation may occur in old people, and many middle-aged people with treated endocrine disease live into old age. Some glandular disorders are common in the elderly (for example, thyroid disease and diabetes mellitus), but the only certain hormonal "disease" of old age is the decline in gonadal function—which happens quickly in women at the menopause and more slowly in men in later life. We do not know whether this inevitable ovarian and testicular failure causes ageing of other tissues, though possibly women who have an abnormally early menopause have a shorter life expectation than other women. Probably one reason for the long survival of women compared with men (some five years more, on average) is a protective effect of female hormones from menarche to menopause. Unfortunately we do not have any hormonal therapy which can prevent ageing in either sex by replacement of sex hormones given from middle

age onwards, or starting in old age. There is no justification for giving female hormones to men to prevent ageing. The use of oestrogenic hormones in elderly men with prostatic carcinoma is associated with a very substantial risk of thromboembolic disease and fluid retention. Therapy with sex hormones in older people may prove useful in the prevention and treatment of osteoporosis (Nordin¹ has reviewed possible reasons for postmenopausal calcium loss) and help alleviate arthritic and inflammatory conditions by interfering with prostaglandin synthesis. These are fascinating speculations but it is much more important to discuss the problems of diagnosing, investigating, and treating "classical" endocrine syndromes affecting old people.

Endocrine syndromes may present at any age with a florid picture of hyperactivity (for example, exophthalmic thyrotoxicosis) or hypoactivity (for example, hypopituitarism). Nevertheless, these are rare in very old people, probably because of the way endocrine dysfunction tends to have widespread and non-specific effects, the modifying effects of other accumulated pathologies, and multiple prescribing. The second and third factors are very common in old age and both modify target-organ response and laboratory tests. Our inpatients have an average of almost one endocrine "problem" each, classifying problems as proved endocrine diseases and abnormal endocrine function tests without apparent disease. Over half are receiving three or more drugs. The problems of interpreting the results of

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laboratory tests in the elderly are so great that we may miss people with occult disease but apparently normal tests. Neoplastic disease is common in old age and may be associated with a whole range of endocrine syndromes (which are often atypical), so that we may also be missing endocrine problems associated with malignancies.

It is difficult to decide whether all or many old people should be subjected to some form of biochemical screening. Hospital surveys have shown a high incidence of disorders affecting pancreatic and thyroidal function, and calcium and electrolyte balance. In deciding on the need for screening the following important points should be remembered:

(1) Great clinical skill may be needed to identify all the different medical problems affecting an old person.

(2) Endocrine disease is common in old age, may be lethal, and may be easy to treat once diagnosed.

(3) There are practical and semantic difficulties in the concept of a "normal" range for biochemical values in old age—abnormal results are common but do not always imply endocrine disease.

(4) Side effects of any treatment should be balanced against the complications of the disease being treated with even more care than in younger people. This is particularly important when the diagnosis of the disease may be difficult, and any drug therapy may overload an elderly recipient's mental capabilities and metabolizing and clearance systems.

Diabetes Mellitus

About a quarter of the population over 75 have abnormal (diabetic) glucose tolerance tests.³ It is often difficult and usually unnecessary to perform a standard test in old people as the diagnosis can often be made from single blood sugar estimation and the clinical features. A clearly raised random, fasting, or two hour postprandial value may be diagnostic. It has been suggested⁴ that the most scientific approach is to regard a random level of more than 180 mg/100 ml as an indication for a G.T.T., if not proof in its own right. Urine testing may not always reveal glycosuria in elderly people with hyperglycaemia because of the general decline of glomerular filtration rate and rise in renal glucose threshold. Blood-glucose estimations should be obtained in emergencies if possible, but Dextrostix or Reflectance-meter-Dextrostix measurements may help in making rapid clinical decisions, particularly in suspected hypoglycaemia.

Severe hyperglycaemia may develop rapidly for the first time at any age, but most older diabetics have a mild disturbance of carbohydrate metabolism. Complications of the disease and of treatment (see table) are usually more important than hyperglycaemia. The problem is to decide what antidiabetic treatment (if any) apart from that demanded by diabetic coma will minimize or prevent the associated diseases. Energetic treatment may have serious hazards, and the long-term benefits of sulphonylureas have been doubted, with evidence from an American

survey^{5, 6} conflicting with opinions from other parts of the world.

Keto-acidosis may develop for the first time in very old people. They tend to succumb rapidly to metabolic disturbances and infections, which may be the cause of or the consequence of deterioration. Abdominal pain may be a striking feature (as well as polydipsia, polyuria, dehydration, etc.), and is also common in non-ketotic hyperosmolar coma. This may occur at any age,⁷ but is more frequent in older age groups, and often develops in people not previously known to be diabetic. Urine testing and blood-sugar measurements are therefore indicated in confused or comatose elderly people particularly if they are dehydrated and have complained previously of thirst, polyuria, and abdominal pain.

MANAGEMENT

If an older person has diabetes requiring treatment, some instruction about the disease should be given if possible (and to relatives and friends where necessary); this should explain the significance of urine testing and of the treatment prescribed. Dietary advice may be difficult to follow even when carefully explained, and an additional problem in the elderly is that carbohydrate-rich diets are usually cheap and well-wishers may offer tempting sugary foods. It is distressingly common to find oral agents and insulin prescribed for old people who have not been told about the possible side effects. When urine tests are performed, negative results in spite of underlying hyperglycaemia are common, which may protect old people from over-enthusiastic treatment. It may be necessary to accept random blood sugar levels of 150–200 mg/100 ml as satisfactory, and even higher levels are sometimes tolerated remarkably well.

The principles of treatment are the same at any age:

Diet

Carbohydrate intake should be restricted if possible (for example, 100–120 g/day in a small elderly woman), as should total calories in the obese. Dietary advice is still important for those on tablets and insulin.

Oral Antidiabetic Agents

Oral antidiabetic drugs are cumulative and may cause severe prolonged hypoglycaemia in the elderly, who usually require smaller doses than younger diabetics. Other side effects include gastrointestinal upsets, rashes, and jaundice. Tolbutamide (up to 0.5 g thrice daily), and chlorpropamide (100 to 350 mg/day) are still the most useful, and may be supplemented with a biguanide especially in the obese, (but gastrointestinal side effects are common).

Insulin

More than one injection a day should be avoided if possible, by using Insulin Zinc (Lente) or by giving soluble and protamine zinc insulin (P.Z.I.) injections at the same time. A sliding scale of insulin dosage is indicated to cover illnesses and operations, but as it only prevents trouble by frequent monitoring of past events, the aim should be an early return to insulin once a day. It is often possible to stop insulin entirely after concurrent illness is treated. Another person will need to inject insulin if the diabetic is confused or has poor sight.

Hyperglycaemia

A general practitioner may be able to identify and reverse

Complications of Diabetes Mellitus and of its Treatment

Mechanism or Target Organ	Effect
Hyperglycaemia	Keto-acidotic coma Hyper-osmolar non-ketotic coma
Atherosclerosis	Cerebral, coronary, renal, mesenteric thrombosis Peripheral vessels
Kidney	Infections, nephrosis, renal failure
Eyes	Cataracts Diabetic and atherosclerotic retinopathy
Nerves	Autonomic neuropathy (postural hypotension, diarrhoea) Sensory neuropathy (painless ulceration of feet) Amyotrophy (affecting legs)
Infections	Skin (especially of feet and flexures), chest, renal
Treatment	Hypoglycaemia (neuroglycopenia) Long-term morbidity of oral agents

deteriorating control in an elderly diabetic at home, but precoma and coma are medical emergencies. Both ketotic and hyperosmolar forms require intensive hospital care, with frequent biochemical estimations, and specific treatment for precipitating causes such as chest and urine infections. The mortality rate is well above the 10% described for younger patients,⁸ even if a geriatric or medical ward is used to managing such patients.

Hypoglycaemia

Hypoglycaemia may not be obvious and can cause confusion or headache, as well as shivering, sweating, and vasoconstriction. These attacks may occur at any time of the day or night. Neuroglycopenia is a serious hazard and may rapidly cause severe and permanent brain damage. If prevention by cautious drug therapy and patient education has failed, rapid correction of a low blood sugar is imperative. Intravenous glucose is effective but messy to handle, and improvement may not be so rapid as with glucagon. This can be given parenterally (and by a nurse) in a dose of 0.25 mg, and should be in a general practitioner's emergency bag. Treatment with glucagon or glucose is usually justified in suspected but non-proved cases of hypoglycaemia in the elderly and failure to improve does not necessarily disprove the diagnosis. Recovery should be followed with oral carbohydrate, and long-term measures to prevent recurrence.

Associated Diseases

Diseases associated with diabetes read like a catalogue of geriatric medicine (see table), and are usually more important than the diabetes. Some aggravate pre-existing diabetes or lead to its discovery—for example, chest and urinary infections. Simple measures to control some of these diseases may be very effective, including care of the skin, sensible foot-wear and chiropody. Conservative or extensive surgery for infections, neuropathies, and arteriopathies of the feet and legs may be justified, even in very old people.

Most blind people are elderly⁹. Diabetic retinopathy and cataracts in a diabetic are common causes of blindness. Like many of the "associated" diseases, cataract tends to develop at a younger age and progress more rapidly in diabetics than in non-diabetics. Cataract extraction should always be considered even in a severe elderly diabetic, and may make a dramatic difference to life, including a return to independence for urine testing and insulin administration. Registration of those with partial or no sight is financially helpful, though it may be difficult to find suitable local authority accommodation once an elderly person has been registered.

The main aims of treatment in elderly diabetics are to avoid hypoglycaemia and severe hyperglycaemia, to reduce gross obesity, and to minimize the development and progression of associated diseases.

Thyroid Disease

Myxoedema, thyrotoxicosis, and symptoms and signs which may be due to thyroid disease are common in old age and several lesions may contribute to one or more of the clinical features in ill old people. This is particularly true of thyroid dysfunction—for example, confusion, anaemia, constipation, and ischaemic heart disease may co-exist with (and hide) hypothyroidism, or be caused by it. Similarly thyrotoxicosis may contribute to confusion, diarrhoea, and congestive cardiac failure. Both may develop insidiously and be so atypical that even a doctor with a high index of suspicion can miss the diagnosis: it has happened that a thyrotoxic old lady has been suspected initially of being myxoedematous.

These diagnostic problems and the serious complications of

treatment justify asking for laboratory confirmation of suspected thyroid disease in old age.

Over 5% of our geriatric admissions have thyroid disease and many more have abnormal thyroid function tests. Abnormal tests are often caused by changes in plasma proteins,¹⁰ which are common in old age, in ill people, and may be caused by drugs interfering with protein-binding. Drugs and x-ray media may also affect tests by iodide contamination and other mechanisms. Present evidence suggests that all old people admitted to hospital, and any old person at home who is suspected of having thyroid disease, should have thyroid function tests carried out. This usually means at least two in-vitro tests (in addition to any other "screening" tests for other occult but common pathologies) such as protein-bound-iodine (P.B.I.) and tri-iodothyronine (T-3) resin uptake, serum T-3 and thyroxine (T-4), free thyroxine index (F.T.I.) or effective thyroxine ratio (E.T.R.) or any combination offered by the laboratory. The aim is to minimize conflicting evidence from abnormal tests and the clinical picture. It may still be necessary to ask for in-vivo tests such as thyroidal gland uptake.

Assessment of target organ function is rarely helpful in diagnosing thyroid dysfunction in old age, as it may be abnormal for other reasons (for example, weight, pulse, serum cholesterol, E.C.G.) or difficult to elicit (for example, tendon reflex relaxation time). Such assessment may be more useful in monitoring the response to treatment, particularly when the results of investigations have been conflicting and treatment has been started mainly on clinical grounds.

HYPOTHYROIDISM

The prevalence of hypothyroidism in the aged is uncertain. Preliminary analysis of thyroid function tests in volunteers taking part in a survey in Camden (part of a National Hypothermia Study¹¹) has shown that over 4% had hypothyroid results. The sample was not random, but the subjects were all living at home and relatively fit so this figure may be an underestimate.

Many doctors will have seen cold, bloated, constipated, and apathetic old women with myxoedema who have responded dramatically to replacement therapy. Some of these patients (and others with less obvious but proven hypothyroidism) die soon after starting treatment. This may be because other lesions have taken their toll, but cardiac function in the elderly is particularly vulnerable to excessive and too rapid thyroxine replacement. Treatment must therefore be based on a combination of clinical acumen and laboratory confirmation, and the response to treatment monitored very carefully. Iatrogenically-induced myxoedema has been recommended to alleviate angina, but cardiac (and respiratory) function is improved after treating hypothyroidism¹². Cautious but effective treatment is therefore justified in myxoedematous patients with ischaemic heart disease.

Clinical suspicion of thyroid lack should be aroused by the presence of a goitre or thyroidectomy scar, a history of thyroid treatment, a family history of thyroid disease, and the finding of a slow pulse or delayed relaxation of tendon reflexes. Cold intolerance, dry skin, croaky voice, deafness, rheumatism, ataxia, constipation, and confusion are common but non-specific features. A past history of antithyroid treatment is particularly significant. The risk of developing hypothyroidism after both radio-iodine and surgical treatment of thyrotoxicosis is so high^{13 14} that such patients should be followed up for life. A computer-based hospital/general-practitioner system has been developed in Aberdeen for this purpose.¹⁵ It has also been suggested¹⁶ that treatment is often discontinued or inadequate in myxoedematous patients.

There is no justification for replacement therapy with anything other than L-thyroxine (LT-4).

Thyroid extract, L-tri-iodothyronine (LT-3), and LT-4/LT-3 mixtures have no advantage apart from treating hypothermia caused by hypothyroidism with rapidly acting LT-3. Myxoedema is a rare cause of hypothermia (which has been discussed more fully in another

article), but the clinical features and results of tests done while the patient is hypothermic may falsely suggest myxoedema.

LT-4 treatment should be started cautiously in the elderly. An initial daily dose of 0.05 mg will produce its maximum effect after one to two weeks, when a full reassessment of the clinical state and target-organ function will usually justify a cautious increase in the daily dose by 0.025 or 0.05 mg. Further small increments may be introduced at similar intervals, and few old people need more than 0.2 mg a day to restore euthyroidism. Some seem to need as much as 0.5 or 0.6 mg of LT-4 a day but should reach this dose only after a long period of close hospital and general-practitioner liaison. If thyroid-stimulating-hormone (T.S.H.) assay becomes widely available and less controversial it may help judge the adequacy of LT-4 treatment. In spite of adequate therapy the symptoms and signs may not improve on LT-4—the mental state may remain impaired and constipation and heart failure persist—and a raised T.S.H. level would justify increasing the dose.

Angina and heart failure may get worse during the initial stages of treatment, and even heart attacks and sudden death may occur in elderly patients. If heart disease worsens at the start of treatment a β -adrenergic blocking agent may be added to the LT-4. Propanolol is used (for example, at a dose of 10 mg thrice daily) but may aggravate heart failure and hypotension so that the more cardioselective practolol may be preferable.

HYPERTHYROIDISM

All the cases of thyrotoxicosis admitted to a geriatric unit were "atypical",¹⁷ and were 2% of all admissions. Loss of weight, muscle weakness, apathy, and cardiac abnormalities tend to dominate the clinical picture in old people. A basic rule in the elderly is that more than one disease may be causing the same problem. Cardiac failure, even with clear evidence of ischaemic heart disease, may be refractory to treatment because of hyperthyroidism. Absence of atrial fibrillation would militate against the diagnosis as this is so very common in old people with heart disease and with thyrotoxicosis.

The results of thyroid function tests in the elderly may be slightly less confusing in suspected hyperthyroidism than in myxoedema, and studies of radio-iodine uptake by the thyroid gland may be more useful. The likelihood that the recently described syndrome of T-3 thyrotoxicosis may cause disease in very old people has not yet been confirmed, but may be the reason for clinical suspicion of hyperthyroidism being negated by apparently normal test results.

The great risk of hypothyroidism after both surgical and radio-iodine treatment of thyrotoxicosis has been mentioned. The incidence of hypothyroidism is already high one year after treatment, with a continual rise in the risk with each subsequent year. Though radio-iodine is an easy treatment which can be given to outpatients, it does not usually bring a hyperactive thyroid under control for some months. Antithyroid drugs are therefore the treatment of first choice in old people and carbimazole is the most widely used drug in the U.K. An average starting dose of 25 mg thrice daily may be reduced to 5-10 mg thrice daily after some months. Rashes and blood dyscrasias are relatively uncommon side-effects. β -adrenergic blockers (see hypothyroidism) may be useful particularly in patients with tachycardia, and we have successfully controlled elderly thyrotoxics on propanolol alone. Any antithyroid drug should be reviewed regularly, and can be discontinued when the disease remits, which is usually between one and two years after the onset.

Calcium and Electrolytes

Diseases affecting calcium and electrolyte balance, and abnormal values obtained in biochemical screening, are common in old people. They are discussed in detail in other papers in this series, but endocrine factors are often important.

Abnormally high and low calcium values are often found in elderly patients admitted to hospital. Hypercalcaemia is often

associated with neoplastic disease (of bronchus, breast, prostate, and rarely colon) due to bony metastases or "ectopic" parathormone production by the tumour. This and other ectopic hormone syndromes associated with carcinoma may occur in very old people. They may cause gross biochemical disturbances and illnesses such as hypercalcaemia with gastrointestinal upset and renal damage, and oversecretion of adrenocorticotrophic hormone with all the hazards of Cushing's syndrome (especially weakness and confusion due to potassium and chloride loss). Hyperparathyroidism may cause mental impairment but it is depressingly unrewarding to search for it and for other biochemical causes of dementia (such as myxoedema or Vitamin B₁₂ deficiency). Hypercalcaemia is also a real risk of excessive Vitamin D treatment of osteomalacia.

PAGET'S DISEASE

The recently discovered hormone thyrocalcitonin has been recommended to treat Paget's disease¹⁸ and osteoporosis, because of its action in inhibiting bone resorption. Its use in both diseases is rather empirical because there is no evidence that it is remedying a deficiency state. Response is difficult to monitor because both diseases tend to have been present for a long time, and the only abnormality of calcium biochemistry is a raised alkaline phosphatase in Paget's disease and sometimes a slightly raised alkaline phosphatase in osteoporosis immediately after a fracture.

ALDOSTERONE

Hyperaldosteronism may occur in old people with congestive cardiac failure and hepatic and renal disease, and causes salt and water retention. An aldosterone antagonist (for example, spironolactone 25 mg thrice daily) may be useful in clearing resistant oedema but may have to be added to an already complicated drug regimen and take some two to three weeks to produce its maximum effect. Ankle oedema in the elderly is common, and it is often unnecessary to abolish it by obsessional treatment even if other signs of heart failure are present.

ANTIDIURETIC HORMONE

Secretion of antidiuretic hormone may be inappropriately increased in several conditions affecting the elderly—such as carcinoma of the bronchus, pneumonia, and hypothyroidism. The effect is to produce a low serum osmolality due to water retention and sodium loss. This causes vague symptoms of weakness, loss of appetite, confusion, and eventually death. Treatment may be difficult but should be as energetic as possible as the symptoms may be so unpleasant. Treatment of underlying conditions, and by water restriction, should be monitored biochemically.

Adrenal Function

Some abnormalities of adrenal function tests have been described in elderly people without endocrine disease¹⁹, but there is no evidence of any decline in adrenal cortical or medullary function in old age. Corticosteroids may be indicated in the treatment of specific diseases such as rheumatoid arthritis. They may also be used in larger non-physiological doses in "shocked" patients. The mineralocorticoid α -fludrocortisone is sometimes helpful in treating postural hypotension, though getting up slowly, "heavy-duty" tights, and salt supplements are more useful.

Gonadal Function

One important effect of the decline in gonadal function

in old age is that changes in secondary sexual characteristics may cause mild or serious disability (for example, "senile" vaginitis or leukoplakia) and/or reduce sexual activity in elderly couples who might otherwise have continued a more physical relationship. Of course, older people are influenced by their own and society's emotional attitudes, which have tended to encourage a reduction in the physical aspects of sexual relationships. Nevertheless, strong physical and mental links may persist into extreme old age. One consequence is the way the survivor of a very long partnership often dies soon after the other. It is difficult to make any specific recommendation regarding replacement therapy. Short and long-term sex-hormone therapy have serious hazards when given parenterally but they occasionally help improve incontinence. Topical applications of an oestrogen cream may help so-called "senile" vaginitis (the patient is not really senile—she is old and has a medical problem). Bleeding may be a problem with such creams, and topical corticosteroids may be effective, though they too have side effects.

Conclusions

There is no evidence that hormone supplements or hormonal ablation can improve the health or life-expectation of old people, unless indicated to treat a specific endocrine disease. Endocrine diseases are common in old age and may often be atypical in their

presentation. Great skill may be needed in their diagnosis and management.

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Today's Treatment

Diseases of the Skin

Treatment of Scalp Disorders

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The skin of the scalp is no different from other body skin, but its covering of hair and its visibility make it important cosmetically. The treatment for generalized dermatoses may also be applied to the scalp, but the presence of hair may mean that the concentrations of active constituents and of vehicles have to be changed.

Dandruff and Seborrhoeic Dermatitis

Normally all hairy animals have skin keratin flakes arising from the skin. The stage at which ordinary desquamation becomes pathological is not clear, though histological examination of troublesome dandruff shows an appearance resembling eczema with parakeratotic (nucleated) keratin scales.

Shampoos are the most important aspect of treatment, as the scales are often made more adherent to the hair by sebum. Many people suffering from dandruff do not wash their hair frequently enough, and many problems are solved when they begin to use a shampoo two or three times a week. Apart from detergents a very wide variety of chemicals are added to shampoos, and the effective ones in treating dandruff include coal tar, purified coal tar derivatives, antiseptics, zinc pyridium thiol, and selenium sulphide. But as they are in contact with the scalp and hair for only a short time, these ingredients must act rapidly if they are to be effective, unless they are chemically fixed to keratin. Zinc pyridium thiol is in Head and Shoulders, Deep Cleansing Shampoo, and ZP11, none of which proprietary shampoos can be prescribed for National Health Service dispensing, yet they are helpful in the control of dandruff.

Shampoos containing selenium sulphide include Selsun and Lenium. They appear to act by reducing the mitotic activity of epidermal cells. Many patients are helped by them, but some complain of an increase in the greasiness of the scalp when they use them for a long time. As with other shampoos the detergent bases vary and often one is more acceptable than another.

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