explained on analytical grounds as lipid analyses performed in different laboratories give consistent results.^{1,3} Also, the men in the present study served as an internal control. The influence of diet and parity cannot be excluded as major contributors to this phenomenon, but Gupta and colleagues do not provide good data on these points. The endocrine control of plasma high density lipoprotein cholesterol concentrations has been widely studied, and the effect of insulin resistance in this group may be important.⁴

Gupta and colleagues' study adds weight to the increasing body of evidence that Asian women are at increased risk of coronary heart disease. We may expect an increase in the incidence of coronary heart disease in the British Asian population in the next decade, and further studies are urgently required.

NAVEED A SATTAR
Registrar
ALLAN GAW
Lecturer

Department of Pathological Biochemistry,
Royal Infirmary,
Glasgow G4 0SF

1 Gupta R, Gupta VP, Ahluwalia NS. Educational status, coronary heart disease, and coronary risk factor prevalence in a rural population of India. *BMJ* 1994;309:1332-6. (19 November.)
2 Heiss G, Tamir I, Davis CE, Tyroler HA, Rifkind BM, Schonfeld G, et al. Lipoprotein-cholesterol distributions in selected North American populations: the Lipid Research Clinics program prevalence study. *Circulation* 1980;61:302-15.
3 McKeigue PM, Marmot MG, Adelstein AM, Hunt SP, Shipley MJ, Butler SM, et al. Diet and risk factors for coronary heart disease in Asians in northwest London. *Lancet* 1985;iii:1086-90.
4 McKeigue PM, Shah B, Marmot MG. Relation of central obesity and insulin resistance with high diabetes prevalence and cardiovascular risk in South Asians. *Lancet* 1991;337:382-6.

Temperature and cardiovascular mortality

EDITOR,—As Peter Wilmshurst points out, international rates of cardiovascular disease generally become higher as the temperatures become colder¹; this pattern holds true even within many countries. Scotland, however, shows the opposite, as colleagues and I found in our studies of geographical patterns of mortality from various diseases in Scotland.^{2,4} We examined the standardised mortality ratios for diseases during three quinquenniums (1959-63, 1969-73, and 1979-83) for the communities described in the annual reports of the registrar general for Scotland: 231 and 234 communities (cities, large and small burghs, and landward areas) in the first two quinquenniums respectively and the 56 local government districts in the last quinquennium.

The table shows the percentages of communities with standardised mortality ratios for coronary heart disease (*International Classification of Diseases* (ICD), seventh revision, codes 420-422; eighth and ninth revisions, codes 410-414) significantly

($P < 0.05$) high or low in the regions in the three categories of latitude (the corresponding numbers are given in the references). Because the diagnoses of coronary heart disease and cerebrovascular disease are liable to be confused, the pattern for heart disease would have been explicable as a diagnostic artefact if a reverse trend for cerebrovascular disease had been found. The comparable data for cerebrovascular disease (ICD, seventh revision, codes 450-468; eighth and ninth revisions, codes 430-438) showed a pattern broadly similar to that for heart disease, though less pronounced (table).

A knowledge of the locations of the regions or a view of the maps of these diseases² also shows a tendency for mortality to rise from east to west. Thus the milder climate in the southwest and, indeed, along the whole west coast, due to the Gulf Stream seems also to promote higher mortality from cardiovascular diseases in the communities there. By contrast, the colder and bleaker environment in the northeast seems to keep people's hearts warm longer. What genetic (Celtish or Pictish) or dietary differences overrule the climatic gradient to cause this Scottish paradox?

OWEN L LLOYD
Professor

Faculty of Medicine and Health Sciences,
Department of Public Health and Occupational Medicine,
United Aab Emirates University,
Al Ain,
United Arab Emirates

1 Wilmshurst P. Temperature and cardiovascular mortality. *BMJ* 1994;309:1029-30. (22 October.)
2 Lloyd OL, Williams FLR, Berry WG, Florey C du V, eds. *An atlas of mortality in Scotland*. London: Croom Helm, 1987.
3 Williams FLR, Lloyd OL, Berry WG. High mortality from heart disease in SW Scottish communities during three quinquennia. *Public Health* 1986;100:343-51.
4 Williams FLR, Lloyd OL. Cerebrovascular disease in Scotland during 1959-1983: its geographical distribution and associations. *Community Med* 1989;11:306-15.

Diagnosing pulmonary embolism

EDITOR,—In his editorial on diagnosing pulmonary embolism Kenneth M Moser expresses the desire for a test—ideally rapid, non-invasive, and widely available—that “would rule in or rule out the diagnosis of venous thromboembolism with a high degree of certainty.”¹ A (nearly) exclusionary test would be valuable, especially when combined with other well studied non-invasive tests for deep vein thrombosis. Such a test exists and deserves wider recognition and use: liquid crystal thermography of the lower limbs.^{2,3} A normal result of this procedure excludes deep vein thrombosis with a high degree of certainty (97-100%),^{2,4} and the test is rapid and non-invasive. It is not widely available, but there is no reason why it should not be. It is simple to perform, free of risk, and cheap in both capital and revenue costs.

Deep vein thrombosis is detected by liquid

crystal thermography because of increased skin temperature plus loss of the normal temperature gradient in the affected lower limb due to changes in the capillary skin circulation mediated by vasoactive amines released from the site of thrombus formation. The small percentage of false negative results is due to thrombi that are not propagating or undergoing thrombolysis; they are not likely to be a potential source of emboli and are therefore not of immediate clinical importance. A normal result of liquid crystal thermography thus effectively excludes deep vein thrombosis and saves the patient from unnecessary further investigation or treatment with anticoagulant drugs.

Liquid crystal thermography is non-specific, so confirmatory tests for deep vein thrombosis are indicated when the result is positive. Deep vein thrombosis can, however, be confidently excluded in over one third of patients in whom it is clinically suspected, and thus these patients can be spared further investigation.³ This results in considerable saving in time and effort with regard to conventional investigations and in revenue savings, no matter what method of investigation of deep vein thrombosis is usually used. In institutions where lower limb venography remains the usual investigation for deep vein thrombosis, use of liquid crystal thermography has the added advantage that the risks due to ionising radiation or allergy to contrast medium, which arise in 36% of patients, are avoided.⁵

J RICHARD HARDING
Consultant radiologist

Department of Clinical Radiology,
Royal Gwent and St Woolos Hospitals,
Newport,
Gwent NP9 4SZ

1 Moser KM. Diagnosing pulmonary embolism. *BMJ* 1994;309:1525-6. (10 December.)
2 Sandler DA, Martin JF. Liquid crystal thermography as a screening test for deep-vein thrombosis. *Lancet* 1985;ii:665-8.
3 Harding JR. Liquid crystal thermography in the investigation of suspected DVT. *Br J Radiol* 1990;63:993-4.
4 Kalodiki E, Marston R, Voltes N, Leon M, Labropoulos N, Fisher CM, et al. The combination of liquid crystal thermography and duplex scanning in the diagnosis of deep vein thrombosis. *Eur J Vasc Surg* 1992;6:311-6.
5 Harding JR. Liquid crystal thermography in the investigation of deep venous thrombosis: a prospective study of 800 patients. *Thrombologie Österreich* 1994;4:183.

Interpretation of electrocardiograms

Interpretation of the ECG is as much an art as a science

EDITOR,—The ability to measure the PR and QT intervals accurately is useful for preclinical medical students. It might also reasonably be expected of cardiologists. It is not, however, equivalent to the intellectual process of interpretation of the electrocardiogram, as the title of Hugh Montgomery and colleagues' short paper suggests.¹ Interpretation often involves a doctor making a clinical diagnosis such as acute myocardial infarction, “old” myocardial infarction, left ventricular hypertrophy, or atrial fibrillation. The electrocardiogram is used extensively by the wide range of doctors who treat the commonest heart condition—that is, coronary artery disease. Accurate interpretation of the electrocardiogram in a patient with coronary artery disease is often difficult, and in many patients the abnormalities of the ST segment or t wave can be described only as non-specific. Measurement of the PR or QT interval is rarely an important component of interpretation of the electrocardiogram in patients seen by general surgeons, cardiothoracic surgeons, or accident and emergency physicians.

Interpretation of the electrocardiogram is as much an art as a science. It is vital, for instance, for appropriate administration of thrombolytic treatment and deserves further investigation by more

Percentages of communities in three categories of latitude in Scotland with significantly high or low standardised mortality ratios (SMRs) for coronary heart disease and cerebrovascular disease

Region	Significantly high SMR			Significantly low SMR		
	1959-63	1969-73	1979-83	1959-63	1969-73	1979-83
Coronary heart disease						
North (Highlands and Islands, Grampian)	0, 3	12, 3	18, 0	28, 17	28, 23	0, 80
Middle (Tayside, Central, Fife, Lothian)	10, 7, 8, 5	0, 13, 4, 5	0, 33, 66, 0	33, 27, 12, 30	24, 13, 15, 25	0, 0, 33, 50
South (Strathclyde, Borders, Dumfries and Galloway)	43, 24, 16	36, 6, 16	63, 0, 75	6, 6, 11	11, 18, 0	11, 25, 0
Cerebrovascular disease						
North (Highlands and Islands, Grampian)	8, 17	24, 6	27, 20	28, 26	28, 29	9, 60
Middle (Tayside, Central, Fife, Lothian)	14, 0, 12, 15	10, 13, 8, 25	0, 33, 66, 25	24, 0, 31, 10	33, 7, 12, 25	33, 0, 33, 50
South (Strathclyde, Borders, Dumfries and Galloway)	23, 6, 21	29, 12, 42	42, 25, 50	11, 12, 11	4, 35, 5	21, 25, 25