bined with oestrogen.¹⁴ Phenothiazines have been shown to increase plasma prolactin¹⁵ and might possibly be associated with an increased incidence of breast cancer.¹⁶ Male patients with gynaecomastia, except when associated with drugs like phenothiazines, do not have raised prolactin levels,¹³ so that this hormone may not be necessary for breast growth (normal or abnormal) in humans.

In summary, we agree that breast cancer response to hormones is a most complex subject. However, we suggest that the theory of different clones within one tumour or its metastases adequately explains variable responses to endocrine manipulation.—We are, etc.,

P. GARCIA-WEBB
M. H. BRIGGS

Alfred Hospital,
Prahran, Victoria,
Australia

- Chen, C. L., and Meites, J., *Endocrinology*, 1970, **86**, 503.
- Kinell, F. A., in *Pharmacology of the Endocrine System and Related Drugs*, ed. M. Tausk, vol. 2, p. 158. Oxford, Pergamon Press, 1972.
- Jacobs, L. S., Mariz, I. K., and Daughaday, W. H., *Journal of Clinical Endocrinology and Metabolism*, 1972, **34**, 484.
- Cooper, E. H., *Cell and Tissue Kinetics*, 1973, **6**, 87.
- Levan, A., *Annals of the New York Academy of Sciences*, 1956, **63**, 774.
- Jensen, E. V., Block, G. E., Smith, S., Kyser, K., and De Sombre, E. R., in *Estrogen Target Tissues and Neoplasia*, ed. T. L. Dao, p. 23. Chicago, University of Chicago Press, 1972.
- McQuire, W. J., *Journal of Clinical Investigation*, 1973, **52**, 73.
- Engelsman, E., Persijn, J. P., Korsten, C. B., and Cleton, F. J., *British Medical Journal*, 1973, **2**, 750.
- Wiener, F., Fenyo, E. M., Klein, G., and Harris, H., *Nature New Biology*, 1972, **238**, 156.
- Flax, H., Salih, H., Newton, K. A., and Hobbs, J. R., *Lancet*, 1973, **1**, 1204.
- Heuson, J. C., and Tagnon, H. J., *Lancet*, 1973, **2**, 203.
- Boyns, A. R., et al., *European Journal of Cancer*, 1973, **9**, 99.
- Minton, J. P., and Dickey, R. P., *Surgery, Gynecology and Obstetrics*, 1973, **136**, 971.
- Stoll, B. A., *Lancet*, 1972, **1**, 431.
- Turkington, R. W., *Journal of Clinical Endocrinology*, 1972, **34**, 62.
- Ettigi, P., Lal, S., and Friesen, H. G., *Lancet*, 1973, **2**, 266.

Levodopa and Growth Hormone Secretion

SIR,—In your leading article on "Glucagon and Growth Hormone" (27 January, p. 188) you state that glucagon stimulation is an effective test of growth hormone release but, since it is less reliable and takes longer to perform than the insulin test, it should be regarded only as "a good second-line test." Though Drs. C. T. Sawin and M. L. Mitchell (1 September, p. 499) have pointed out that the reliability of the glucagon provocative test can be improved by pre-treatment with propranolol,¹ we should like to draw attention to another reliable test of growth hormone release, using levodopa as the stimulant, which has recently been investigated by several authors, including ourselves.²⁻⁴ The preliminary results of our study of the effect of levodopa on growth hormone release in elderly normal subjects and in elderly subjects with cerebrovascular hemiplegia are reported briefly here.

Plasma growth hormone levels before and after a single oral dose of levodopa (500 mg) were measured by a double antibody radioimmunoassay technique in seven clinically normal elderly subjects aged 64-83 (average 77.0) years and in seven elderly patients aged 66-76 (average 72.4) years with arterio-sclerotic hemiplegia of at least three months' duration. Mild side effects of levodopa

(nausea) were noted in only four of the 14 subjects. Significant peak levels of growth hormone were found, usually between 60 and 90 minutes after levodopa administration, in 11 of the 14 subjects investigated. There was no significant difference in response between the hemiplegic patients (mean peak plasma growth hormone level ($\pm$ S.D.) 21.7 ± 6.41 ng/ml) and the control group (26.14 ± 5.43 ng/ml). Nor was any significant difference noted between the responses of these two groups of subjects and those of normal adults previously studied.⁴

These results confirm that levodopa stimulation should be regarded as a reliable test of growth hormone release in patients of all ages. Moreover, the test is short in duration, does not require any intravenous infusion or injection, and does not involve any risk of hypoglycaemia.—We are, etc.,

C. F. COLUCCI

S. Maria della Pace Hospital

B. D'ALESSANDRO
A. BELLASTELLA
R. GASBARRO

Institute of Medical Semeiotics and Constitutional Medicine,
University of Naples,
Naples, Italy

- Mitchell, M. L., Suvunrunsi, P., and Sawin, C. T., *Journal of Clinical Endocrinology and Metabolism*, 1971, **32**, 470.
- Eddy, R. L., Jones, A. L., Chakmakjian, Z. H., and Silverthorne, M. C., *Journal of Clinical Endocrinology and Metabolism*, 1971, **33**, 709.
- Weldon, V. V., et al., *Journal of Clinical Endocrinology and Metabolism*, 1973, **36**, 42.
- Bellastella, A., Cafaro, M. R., Colucci, C. F., D'Alessandro, B., and Gasbarro, R., *Bollettino della Società Italiana di Biologia Sperimentale*. In press.

Serum Thyrotrophin and Lipid Levels in Summer and Winter

SIR,—Studies in laboratory animals have shown a significant increase in the serum thyrotrophin (TSH) level and thyroid function on exposure to cold. Fisher and Odell¹ found a small rise in plasma TSH in 12 men exposed to seven days of arctic temperature. Ingbar *et al.*² have reported that serum protein-bound iodine (PBI) levels are reduced during prolonged cold exposure. Such a reduction in the PBI level might be an explanation of the rise in TSH level observed during exposure to cold.

We have examined the possibility that variations in outdoor temperature may influence the TSH level in persons living and working indoors in houses with central heating. In Sweden the difference in mean outdoor temperature between summer and winter can reach 20-30°C. A seasonal variation in the serum cholesterol level has been noted, with slightly higher levels during winter than in summer.^{3,4} Estimations of serum cholesterol and serum triglyceride were therefore included in the study.

The serum TSH values of healthy 50-60 year-old men were measured. Blood samples were taken

from 30 men in August 1971 and from 30 men in January 1972. The mean temperature in August was $+15.3^{\circ}\text{C}$ and in January -5.5°C . There was thus a difference of 20.8°C . The sera from both groups were separated, frozen, and stored in liquid nitrogen. All the samples were analysed at one session. The immunoreactive TSH in 0.1 ml of serum was assayed by a radioimmunosorbent technique⁵ using ^{125}I -labelled human pituitary TSH (National Pituitary Agency) and anti-TSH coupled to cyanogen bromide-activated Sephadex. The standard (Medical Research Council HTSH research standard A) was dissolved in serum with undetectable or low levels of TSH. The limit of sensitivity was $0.5 \mu\text{U/ml}$. The cholesterol and triglycerides were assayed in an isopropanol extract of serum by using a Technicon dual-channel system (N-24A and N-70).

The mean values for serum TSH, cholesterol, and triglyceride levels in August were not significantly different from those in January (see table). We conclude that neither the TSH level nor the levels of cholesterol and triglyceride in serum in healthy men living and working indoors in a country such as Sweden are influenced by seasonal variations in outdoor temperature.

H. HEDSTRAND
L. WIDE

Departments of Internal Medicine and Clinical Chemistry,
University Hospital,
Uppsala, Sweden

- Fisher, D. A., and Odell, W. D., *Journal of Clinical Endocrinology*, 1971, **33**, 859.
- Ingbar, S. H., Kleeman, C. R., Quinn, M., and Bass, D. E., *Clinical Research Proceedings*, 1954, **2**, 86.
- Carlson, L. A., Lindstedt, S., *Acta Medica Scandinavica*, 1968, suppl. no. 493, p. 35.
- Keys, A., Karvonen, M. J., and Fidanza, F., *Lancet*, 1958, **2**, 175.
- Wide, L., *Acta Endocrinologica*, 1969, suppl. no. 142, p. 207.

False Interpretation of Fetal Heart Monitoring

SIR,—Mr. I. L. Craft and his colleagues (29 September, p. 694) have drawn attention to a case in which the maternal rather than the fetal heart rate was recorded by a Hewlett-Packard fetal heart monitor during labour.

The case they describe is one in which, when the fetus was known to have died some time before, a record was obtained on the monitor which proved to be maternal in origin though indistinguishable from a normal fetal heart rate. The explanation for this phenomenon is that once the fetus dies the fetus acts as a conductor for the lower voltage maternal E.C.G. signal which is not cancelled out by the fetal signal. A similar case, with a slower maternal heart rate, has been reported previously.¹ As the authors point out, it is important to be aware that this can happen—on one occasion an unnecessary caesarean section was performed when the fetus had been dead for several hours (personal communication). However, caution must be exercised before making the assumption that the maternal heart rate can

Serum Thyrotrophin and Serum Lipid Levels in Healthy Men in Summer and Winter

	August (30 Subjects)		January (30 Subjects)	
	Geometric Mean	95% Confidence Limits	Geometric Mean	95% Confidence Limits
TSH ($\mu\text{U/ml}$)	3.57	2.17-5.88	3.27	1.18-9.12
Cholesterol (mg/100 ml)	251	150-419	249	162-384
Triglyceride (mmol/l.)	1.41	0.58-3.40	1.57	0.62-4.00

be recorded when the fetus is still alive. The authors suggest that when the fetal circulation is failing there is likely to be a gradual reduction in the voltage of the fetal signal until the maternal rate rather than the fetal is recorded.

Though this alarming possibility is theoretically possible it has never been reported in the literature, nor have I observed it. Before jumping to a conclusion that might detract from the value of continuous monitoring of the fetal heart rate, it would be of considerable interest to find out through your columns whether any of your readers have had such a case which is well documented.—I am, etc.,

R. W. BEARD

Department of Obstetrics and Gynaecology,
St. Mary's Hospital Medical School,
London W.2

1 Beard, R. W., Brudenell, J. M., Feroze, R. M., and Clayton, S. G., *Journal of Obstetrics and Gynaecology of the British Commonwealth*, 1971, 78, 882.

Statistics and the M.R.C.P.

SIR,—The Royal Colleges of Physicians of the United Kingdom are concerned at the apparent lack of acquaintance of many candidates for the diploma of M.R.C.P.(U.K.) with the principles of elementary statistics.

The extensive range of questions provided by Part I of the examination gives the candidate a good opportunity to demonstrate his understanding of the broad field of medicine, even if his knowledge of the various systems is somewhat uneven. However, understanding of the meaning, for instance, of standard deviation and a grasp of the significance of "P" and "r" are essential in modern medicine.

The colleges therefore wish to bring to the notice of prospective candidates that particular attention may be given to statistics in future.—I am, etc.,

J. F. STOKES

Chairman,
Joint Examining Board

Central M.R.C.P.(U.K.) Office,
London N.W.1.

Postpartum Sterilization

SIR,—Professor James Walker (1 September, p. 497) expresses regret that his opposite numbers in Birmingham have abandoned the practice of postpartum sterilization soon after delivery. In our experience, no matter how skilful the operator, any form of abdominal operation (laparotomy) may be an annoyance to the mother busy with her child. On occasion there may even be mild wound sepsis, or one may tend to blame the inevitable loss of ambulation for later thromboembolism. That is not to say that laparotomy carries some risk and laparoscopic sterilization carries none. The instrument must be in the hands of an expert working with a skilled anaesthetist.

Our group, having many years of experience of traditional postpartum sterilization, has come to prefer interval laparoscopic sterilization. The great advantage is that a puerperal laparotomy is avoided. Six weeks after delivery the mother returns for an overnight stay with or without her baby. She may return to her domestic and nursing duties in 24 hours.

We are quite sure that our colleagues in

Dundee put no pressure on their patients to accept sterilization. Nevertheless, a couple with a new baby may have second thoughts on sterilization; our policy of delay allows for this.—We are, etc.,

J. M. EMENS

J. A. JORDAN

H. C. McLAREN

Department of Obstetrics and Gynaecology,
Birmingham and
Midland Hospital for Women,
Birmingham

Think Again on Salmon

SIR,—I was pleased to read your leading article (27 October, p. 186) and heartily endorse your suggestion that the time has come to have another look at the Salmon proposals and how they are working. In a Personal View (16 August 1969, p. 411) I expressed fears for the future and said, "Surely its wise from time to time to stop and think, and to take stock." I consider the time is overdue—the passing years have done nothing to allay these fears.

In the halcyon days before Salmon the nursing services were organized efficiently and economically by matrons and assistant matrons—their offices were within the hospital and a better personal relationship thus obtained between the sisters and nurses. Important decisions could be made without the necessity of referring to a higher authority—number 9 or 10. With the Salmon structure imposed upon us the picture has darkened. There are many more administrators in the name of nursing officers whose duties as a rule do not include nursing as such. The higher numbers sit in their respective offices, when they are not sitting in at endless meetings, removed from the patients and staff, and this tends towards a less personal relationship.

Can we then be surprised that so few senior nurses now wish to remain in the Health Service? In my view this is more and more becoming a service of administrators. The true nurse wishes to remain a practical nurse with clinical responsibilities to the patient, and when promotion comes, as come it should, does not want to be upgraded to a number removed from the bedside. This is the case at the present time with the ward sister, the most valuable member of the nursing team.

The increased cost to the Health Service of all this reorganization must be considerable, and it hardly appears to be a "best buy." With hindsight one wonders how the medical profession allowed the Salmon structure to gain such a stranglehold. As you state, unfortunately in the survey which you cited the nurses were not asked for their views. The time is now overdue to rectify this sad omission. The consultants, too, need to be included. Even at this late hour is it too much to hope that all is not yet lost?—I am, etc.,

A. G. BUTTERS

Cawthorne,
near Barnsley

SIR,—As one of those who have previously expressed concern about the effect that the new structure is having on nursing care and recruitment, I was heartened to read your leading article (27 October, p. 186).

The best ward sisters with whom I have worked are now all reluctantly abandoning

patient care for what is called administration (as if that were not a ward sister's main responsibility) not because they wish to retire from the active practice of their chosen profession but because they wish to ensure an adequate pension, quite apart from finding it a humiliation to come under the command of juniors with less experience who have been promoted over their heads.

May I reiterate that the only way out of the present situation is to increase the pay of ward sisters to a level commensurate with the strain involved in, and the skills required for, this most arduous of nursing responsibilities, and which in my view should be comparable to that of the consultants with whom they work? Girls entering nursing could then look forward to relative affluence in later life commensurate with their qualifications and length of service, while our nursing officers would not be tempted to desert the front line for jobs on the staff.

What has happened to our sister profession could also happen to medicine; already, for instance, the potential maximum earnings of medical administrators are higher than for those who devote their lives to clinical care, research, or teaching. The best comment on such a state of affairs is in Solzhenitsyn's *Cancer Ward*.—I am, etc.,

JOHN DAVIS

University Department of Child Health,
St. Mary's Hospital,

Manchester
1 Solzhenitsyn, A. I., *Cancer Ward*, London, Bodley Head.

Monkeys for Research

SIR,—I think that your leading article "Monkeys for Research" (14 July p. 64) calls for a comment, not because its statements are wrong, but because they are incomplete. The situation of primates and the problems of their use in research have been treated in a very one-sided way.

It is correct that most of the imported primates are in poor condition, if alive at all, when they arrive at their destination, that more than 20% of the animals die in the first few months during the conditioning period, and that most of the animals are infected with parasites, bacteria, or viruses and have reduced resistance to infection owing to the "stress" caused by capturing and transportation. Yet one important fact has not been mentioned. The loss inflicted upon the wild primate populations is not only the sum of the animals actually used in research centres plus approximately one-quarter more lost during the conditioning period; it is much higher. During most capturing actions some animals are killed on the spot accidentally or deliberately, and a high percentage of animals falls victim to inadequate keeping conditions between capture and transportation and during transport itself, which is very often organized in a most deplorable way. It has been calculated that the losses amount to about nine individuals for every one which eventually arrives at its destination. This is still not the whole balance; in the wild populations the remaining social units may be reduced and damaged so much by the capturing activities that they suffer additional losses or are unable to recover at all.

Now let me come to my main criticism. The article is concerned with the difficulties