and zoology); and the personal (language, literature, and history). Medical schools' selection committees should demand excellence in one of these groups, competence in the others, and capability in one of the arts or crafts (why always musical performance?) and a sport.

Selection should also necessitate a year between leaving school and entering university working as a nurse or perhaps as a laboratory technician or porter. This would be a test of vocation and a help to understanding the way that hospitals work. The traditional preclinical grounding would follow with the addition of social anthropology. The study of anatomy should include imaging, or even be based on it. Those teaching physiology and biochemistry should remember the saying that "l'art d'ennuyer c'est tout dire."

I believe that a shortened clinical education on the Cambridge model would be adequate for students who had had a grounding as nurses. It should be possible for the 10% of students with a lien for adding to knowledge to take off a year or two to learn how to conduct research as PhD students.

After qualification the obligatory year before registration should be spent, as now, learning medicine and surgery with perhaps an additional six months in one of the paramedical or unpopular specialties. At the end of this apprenticeship competence in practice (as opposed to theory) should be recognised by the conferment of a licence to practice by one or more of the royal colleges. This need not involve another examination but rather the signatures of the consultants for whom the candidates worked as preregistration house officers attesting to their qualities as bedside practitioners. We could retain the LMSA as an alternative qualification for foreign graduates or those unable for some good reason to get a degree.

What about the teachers?

The colleges could confer an MD on their clinically oriented fellows to parallel the university doctorate won by academic thesis. These reforms would consolidate our lead in clinical medical education. If we agreed to educate enough interns from abroad it might even correct the present imbalance between juniors and seniors (which is in the patients' interests if not those of the profession). We could certainly fill the clinical school at Cambridge with German students 10 times over.

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Non-mydriatic photography and diabetic retinopathy

SIR,—Mr D Jones and others (9 April, p 1029) make the point that non-mydriatic Polaroid photography is not as accurate as fluorescein angiography in detecting preproliferative and proliferative diabetic retinopathy. They suggest, however, that using a non-mydriatic camera "cannot be considered an alternative to ophthalmoscopic examination with mydriasis" and imply that the camera is unsuitable for use as a screening tool.

The authors have not carried out an assessment of this technique as a screening method, nor have they compared it with routine ophthalmoscopy. If they applied their line of reasoning to a similarly inappropriate comparison between ophthalmoscopy with mydriasis and fluorescein angiography they would perhaps suggest that physicians should never use ophthalmoscopes.

Several questions remain to be answered about non-mydriatic retinal photography. Can the technique reveal early treatable retinopathy as well

as or better than the average physician using an ophthalmoscope with mydriasis? What is the educational value of the technique for doctors and students? Does having photographic records of retinal appearances in the case records compensate for the cost?

Non-mydriatic Polaroid photography represents an exciting new development with educational, recording, and screening potential. Large feasibility studies are under way and opinion should await their outcome.

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AUTHORS' REPLY—Dr Taylor suggests that because large feasibility studies are under way non-mydriatic Polaroid photography should remain a sacred cow. Unfortunately non-mydriatic cameras are already in use clinically, and our presentation of the shortfalls of the technique therefore seems to be apposite.

Our aim was to analyse a series of non-mydriatic Polaroid photographs of diabetic fundi taken by non-medical staff under normal working conditions. Since Williams *et al* have advocated using non-mydriatic photography as a screening tool in this way¹ we fail to see why Dr Taylor should question its validity on that score. Our use of fluorescein angiography as the definitive investigation with a 100% detection rate for retinopathy should not seem surprising, although we can appreciate how it might seem a little threatening to physicians.

The need for cost effective screening for diabetic retinopathy is well established.² The use of non-mydriatic cameras as educational or recording tools is a separate issue. When the cameras are used as a screening tool clinical decisions about referral and treatment will be based on the results, and high specificity and sensitivity are therefore essential. Diabetologists and general practitioners are the two main medical groups screening patients. The variation in ophthalmoscopic skills between them is immense, so Dr Taylor's comment about needing to compare Polaroid photographs with the "average" physician's ability to detect retinopathy is, therefore, the most intriguing comment of all.

In our study 20% of the Polaroid prints were unassessable. This would require a 20% call back rate for reassessment by some other method. More importantly, both fundi with neovascular changes were missed by photographic assessment. If a fundus examination with mydriasis had been carried out on these patients would the neovascular changes have been picked up? With a red free filter, used routinely by us, they almost certainly would have been. Use of a red free filter is not a difficult skill to acquire. It necessitates rotating a wheel on the ophthalmoscope. The non-mydriatic camera does not allow any refinement of this type and is not a panacea.

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1 Williams R, Nussey S, Humphry R, Thomson G. Assessment of non-mydriatic fundus photography in the detection of diabetic retinopathy. *Br Med J* 1986;293:1140-2.

2 Bron AJ. Screening for treatable diabetic retinopathy. *Br Med J* 1985;290:1025-6.

to fluorescein angiography for the evaluation of diabetic retinopathy. They conclude that in screening for retinopathy "Polaroid prints obtained with a non-mydriatic camera cannot be considered an alternative to ophthalmoscopic examination with mydriasis." They cannot make such a conclusion from the data presented. To do so it is necessary to compare ophthalmoscopy directly with photography. When this has been done photography has been found to be superior.^{1,3} Although serious lesions may be missed by the camera, a greater number are likely to be missed, in practice, by ophthalmoscopy.⁴

Mr Jones and colleagues are, however, the first to show that pharmacological dilatation of the pupil will virtually abolish poor quality photographs (97.6% good quality photographs). Nevertheless, it should not be assumed from their data that Polaroid films obtained after dilatation would be any less successful than 35 mm transparencies at detecting retinopathy. Only after direct comparison of the two photographic media under the same conditions could such a conclusion be reached. Previous studies have not suggested a difference⁵ and Polaroid films have several advantages.⁶

The non-mydriatic cameras should perhaps be renamed—"4 mm pupil camera" would be a less confusing term, and the camera could be used with or without mydriasis as appropriate. If photographs were taken through undilated pupils initially this would result in good quality photographs in 70-80% of cases.^{1,5} Good quality photographs could then be obtained in most of the remaining cases after mydriasis. Future pictures in these 20-30% of cases could always be taken with pupil dilatation. Alternatively, as the camera allows the pupil to be seen on the monitor screen it may be possible to measure the pupil before photography and detect those requiring a mydriatic.

There need not be an argument as to whether ophthalmoscopy or photography is superior. If both were undertaken they could complement each other. If retinopathy is present the camera is more likely to detect it.^{1,3} Any retinopathy seen on photography should cause the doctor to look more carefully for new vessels and other lesions beyond the camera's field. Patient numbers are such that many clinics are staffed, of necessity and often predominantly, by relatively inexperienced junior doctors or clinical assistants. The photographs allow the more senior doctors to select the patients they would like to examine personally.

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- 2 Taylor R, Lovelock L, Alberti KGM. Northern region diabetic retinopathy screening project: preliminary report. *Diabetic Medicine* 1987;4:576A.
- 3 Ryder REJ, Young S, Vora JP, Atiea JA, Owens DR, Hayes TM. Screening for diabetic retinopathy using Polaroid retinal photography through undilated pupils. *Practical Diabetes* 1985;2:34-9.
- 4 Ryder REJ, Young S, Hayes TM. Assessment of non-mydriatic fundus photography in detection of diabetic retinopathy. *Br Med J* 1986;293:1572.
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- 6 Ryder REJ, Hayes TM. Non-mydriatic retinal photography in screening for diabetic retinopathy. *Seminars in Ophthalmology* 1987;2:26-9.

Training in social work

SIR,—As past and present medical members of the Central Council for Education and Training in Social Work we wish to express our concern that the

SIR,—Mr D Jones and colleagues (9 April, p 1029) show that the non-mydriatic camera is inferior