et al.[5] observed that all of 89 American Indians were $Gm(a+)$.

Since it was already well known that the blood-group frequencies of Japanese vary from those of other populations[6,7] it seemed possible that the distribution of the Gm^a factor might also manifest a detectable deviation.

We tested for the Gm^a factor employing rheumatoid arthritis serum, $Gm(a+)$ and $Gm(a-)$ control sera obtained through the courtesy of Dr. R. Grubb, Bacteriological Institute, Lund, Sweden, together with two anti-$Rh_0(D)$ sera selected for their suitability from the specimens which had been stored by one of us (M. Y.) at the Blood Typing Laboratory and Rh Center, Tokyo Medical and Dental University. Later, we received a suitable anti-$Rh_0(D)$ serum from Dr. A. Eyquem, Pasteur Institute, France.

The agglutination–inhibition test (Gm^a grouping) was carried out according to the method of Grubb and Laurell. The tests were performed on 816 normal human sera with the following results: Only 2 (1·0 per cent) of 200 random blood donors in Tokyo and 13 (2·1 per cent) out of 616 blood donors in Kumamoto were found to be $Gm(a-)$. Conversely, we found approximately 98–99 per cent of these sera to be $Gm(a+)$ and the serum factor to be inherited as a dominant Mendelian character (Table 1). In addition, a study was carried out on 34 families whose progeny included identical twins. The test was performed only on the sera of the parents and the twins for a total of 136 tests. Five individuals were found to be $Gm(a-)$. This included 1 parent from each of 4 families and 1 twin from one of these 4 families. Gm^a serum grouping together with other genetic investigations are still being conducted on the family in which one of the identical twins and one of the parents were $Gm(a-)$.

Table 1. The Gm^a Factor in Japanese

No. tested	Gm^a factor $Gm(a+)$ (per cent)	$Gm(a-)$ (per cent)
816	801 (98·13)	15 (1·87)
136*	131 (96·32)	5† (3·68)

* From family study on twins (34 families).
† In four families.

As new blood groups are found and their frequencies determined, it seems probable that additional racial differences will be noted in their distribution. The Gm^a factor together with Gm^x, Gm^b and Gm-like factors should prove also to be useful tools in anthropological research.

We wish to acknowledge the kind assistance of Dr. R. Grubb and Dr. A. Eyquem in this work.

M. Yokoyama*
The Blood Typing Laboratory and Rh Center,
Tokyo Medical and Dental University,
Tokyo.

N. Ueno
Kaketsuken Blood Bank,
Kumamoto, Japan.

* Present address: Division of Biologics Standards, National Institutes of Health, Bethesda 14, Maryland, U.S.A.

[1] Grubb, R., *Acta Path. Microbiol. Scand.*, **39**, 195 (1956).
[2] Grubb, R., and Laurell, A. B., *Acta Path. Microbiol. Scand.*, **39**, 390 (1956)
[3] Moullec, J., Fine, J. M., Henry, Cl., and Silverie, Ch., *Proc. Seventh Congr. Internat. Soc. Blood Transf., Rome* (1958).
[4] Cited from Steinberg, A. G., Stauffer, R., and Fudenberg, H., *Nature*, **185**, 324 (1960).
[5] Steinberg, A. G., Stauffer, R., and Fudenberg, H., *Nature*, **185**, 324 (1960).
[6] Furuhata, T., Yokoyama, M., and Kuniyuki, M., *Proc. Jap. Acad.*, **33** (4), 228 (1957).
[7] Yokoyama, M., Murakata, M., and Ueno, N., *Nature*, **188**, 591 (1960).

The γ-Globulin, Gm^{ab}, in Nigerians

The γ-globulin (Gm) genetic polymorphism, first described by Grubb[1], exhibits considerable geographical variation. Steinberg, Boyer and Stauffer[2] recently observed a striking excess of the phenotype Gm $(a+b+)$ among Negroes in the United States. Accordingly it was suggested that an allele, Gm^{ab}, exists in coloured populations. The allele frequency of Gm^{ab} among 593 Negroes from Maryland and Ohio is 0·690. The difference between this value and unity was taken as an estimate of European genetic admixture in American Negroes. Essential to this estimate was the assumption that Gm^{ab} frequency is nearly 1·00 in native West Africans. Moullec[3] had previously reported that 449 residents of Dakar were all $Gm(a+)$; however, typing of $Gm\ b$ was not then possible and has not since been described in a West African population.

In the present work aliquots of serum or whole blood from 409 native Nigerian blood bank donors was forwarded, by air, from Ibadan to the United States. $Gm\ a$ and $Gm\ b$ were detected in the manner previously described[2].

All individuals were clearly $Gm\ (a+\ b+)$. There is a probability of 0·05 that either Gm^a or Gm^b is present with an allele frequency of 0·05 but was, by chance, omitted from the present survey. The assumption that Gm^{ab} has a frequency of near unity in West Africans is consequently confirmed.

This work was supported in part by United States Public Health Service Grant No. B2053 from the National Institute of Neurological Disease and Blindness.

Samuel H. Boyer
Division of Medical Genetics,
Department of Medicine,
The Johns Hopkins University and Hospital,
Baltimore.

E. J. Watson-Williams
Department of Pathology,
University College Hospital, Ibadan.

[1] Grubb, R., and Laurell, A. B., *Acta Path. Microbiol. Scand.*, **39**, 390 (1956).
[2] Steinberg, A. G., Boyer, S. H., and Stauffer, R., *Nature*, **188**, 169 (1960).
[3] Moullec, J., Fine, J. M., Henry, Cl., and Silverie, Ch., *Proc. Seventh Cong. Int. Soc. Blood Transfusion*, 881 (1958).

PATHOLOGY

Surface Enamel Magnesium and its Possible Relation to Incidence of Caries

Following the semi-empirical administration of a mixture of alkaline phosphate to a group of 200 patients during a period of three years, it has been noticed that the incidence of caries on continuous enamel surfaces has been significantly inhibited at all age-levels. The surface enamel of exfoliated or extracted teeth from these and other patients is being investigated, and the magnesium content has been shown to vary within extremely broad limits.

This magnesium variable has been correlated with caries incidence or inhibition, also with an abrasive or non-abrasive prophylaxis, and finally, with a (possibly) minerally deficient diet or with a minerally enriched diet. The mixed mineral salts supplied were 50 per cent magnesium phosphate, 25 per cent calcium phosphate and a small percentage of potassium, sodium and iron phosphates. They were fluoride-free.