anti-$Rh_{1.2}$ or anti-Rh_1 is preferable to the anti-Rh_2 serum. The practical and theoretical significance of anti-Rh tests in racial studies is evident from the results shown in tables 1 and 2. These are based on tests with anti-Rh_1 and anti-Rh_2 sera.

TABLE 2

TESTS WITH ANTI-Rh_2 SERUM*

Race	Number tested	Percentages +	Percentages −
White[a]	334	73	27
Colored[b]	118	46	54
American Indians[d]	69	58	42
Chinese[e]	150	93	7

* The key to authors of these studies is identical with that given under Table 1.

Since the occurrence of erythroblastosis fetalis depends upon isoimmunization of the Rh- mother, the results in Table 1 indicate that a lower incidence of this condition can be expected in the colored, and that it should be extremely rare in the Chinese and the American Indians. In post-mortem studies of fetal and neonatal conditions, Potter[11] found that the incidence of erythroblastosis fetalis was 2.1 per cent. and 0.7 per cent. for the white and colored, respectively. These observations of Potter are confirmed in our recent study of a vast clinical material and by the results indicated in Table 1. So far as the Chinese are concerned, strong confirmation of the correlation of negative reactions with the anti-Rh_1 serum and the incidence of erythroblastosis fetalis will be presented elsewhere. However, it may be stated here that, as was to be expected on the basis of these results, erythroblastosis fetalis is actually exceedingly rare among Chinese infants. A similar low incidence should occur among American Indians, but clinical evidence to support this view is still to be provided.

Obviously, the observations recorded on the racial differences of the Rh reactions with the anti-Rh_2 serum are of considerable interest from an anthropological view-point. However, there is at present no proof of a relationship of these differences to clinical conditions in the new-born of various races.

The relationship of the anti-Rh_2 serum with another variety, termed anti-Hr, produced by an Rh+ mother of an erythroblastotic infant will be discussed elsewhere.

The author is indebted to Dr. E. M. Katzin for supplying blood specimens of white and colored individuals.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A METHOD FOR THE IDENTIFICATION OF INDIVIDUAL FROGS

THE various books and articles that deal with the technique of animal experimentation give no satisfactory method for the identification of individual frogs. Some authors state that each frog under observation must be kept in a separate container, or at best suggest that various toes be amputated as a means of subsequent recognition. For several years our work has necessitated the examination of large numbers of frogs over a period of several months. An individual record of each animal was essential, but for practical purposes it was often desirable to keep 10 to 15 frogs in a single tank. This was achieved by making a sketch of the markings seen on the back of each animal. These pigment spots are sharply demarcated in the common laboratory frog, *Rana pipiens,* and are never identical in any two of these animals.

The markings on one of the frogs used in our experiments are shown in Fig. 1. A fold of skin extends from the posterior margin of each eye to the iliac crests at "X." The latter are very prominent and give the animal its normal humped appearance when at rest. Between these folds of skin there are characteristically two rows of pigment spots subject to considerable variation. It is with these markings that we are particularly concerned. The simplified diagram of the spots as used in our records is shown

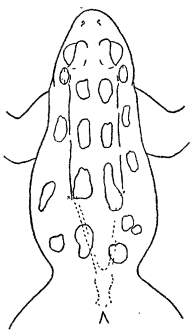

FIG. 1

in Fig. 2 A, where the posterior margin of each eye is indicated by the arc of a circle and each iliac crest by an "X." Figs. 2 B and 2 C portray two variations and the manner of recording them.

We have kept some of these animals for periods of nine to ten months at temperatures ranging from just

[11] E. Potter, *Jour. Am. Med. Asn.,* 115: 996, 1940.

above freezing to 90° F and never noted any significant change in the pattern of the markings. At low temperatures the color of the animal as a whole is quite dark, but the pigment spots are still clearly out-

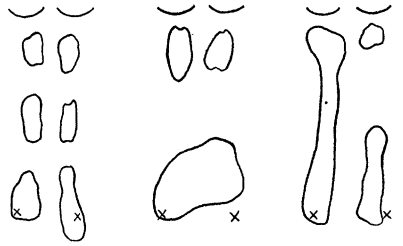

FIG. 2

lined. We have used this method of identification for three years in several hundred frogs and have found it to be consistently satisfactory.

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MONOTHIOGLYCOL

MONOTHIOGLYCOL,[1] CH_2OHCH_2SH (also designated thioglycol, monothioethylene glycol and β- or 2-mercaptoethanol), is a useful non-nitrogenous sulfhydryl reagent for protein investigations. It is a colorless liquid (b.p. 69–70°(28 mm)),[2] completely soluble in water and most organic solvents. Smythe[3] showed that monothioglycol resembled cysteine and glutathione in its reaction with iodoacetate and iodoacetamide, although the reaction time for monothioglycol was slower. Fischer[2] measured the normal oxidation potential and found it approximately equal to that of cysteine (0.44 volt).

The sulfhydryl content of monothioglycol solutions can be determined readily by iodine titration. As with other SH compounds, dilute solutions in acid are more stable than those in the neutral or alkaline pH range (Table I). Monothioglycol can be added to buffer

TABLE I

PERCENTAGE LOSS OF SH FROM 0.1 M MONOTHIOGLYCOL SOLUTIONS IN BUFFER SOLUTIONS[a]

Days	Citrate (0.1 M) pH 3.92	Phosphate (0.067 M) pH 6.74	Phosphate (0.067 M) pH 7.89
1	0.4	3.3	4.6
2	1.5	5.6	7.3
3	2.1	7.7	10.6
5	3.1	13.0	18.7
14	9.0	46.0	51.0

[a] In half-filled glass-stoppered clear glass bottles, diffuse light, 25–30°.

solutions without appreciably changing pH or ionic strength (Table II). It gives a deep red nitroprusside test. The disulfide oxidation product, in contrast to cystine, is soluble in water in all proportions.

TABLE II

CONDUCTANCE OF MONOTHIOGLYCOL

Solute	Solvent	Specific Conductance[a] reciprocal ohms
0.1 M Monothioglycol	0.001 M Acetate buffer (pH 6.5)	5.2×10^{-5}
0.1 M Thioglycolic Acid	0.001 M Acetate buffer (pH 6.5)	3.4×10^{-3}
None	0.001 M Acetate buffer (pH 6.5)	4.4×10^{-5}
0.125 M Monothioglycol	0.1 M Acetate buffer (pH 6.5)	3.4×10^{-3}
None	0.1 M Acetate buffer (pH 6.5)	3.5×10^{-3}
0.125 M Monothioglycol	0.1 M Glycine–NaOH buffer (pH 11.8)	3.6×10^{-3}
None	0.1 M Glycine–NaOH buffer (pH 11.8)	3.8×10^{-3}

[a] Measured at 0.8° C. with freshly prepared solutions.

That monothioglycol is a reducing agent for the disulfide linkages in proteins is indicated by its effect in increasing the solubility of keratins, decreasing the viscosity of enzyme-free wheat gluten dispersions and activating papain. It should be found useful in providing a suitable environment for preventing the air oxidation of reduced proteins during dialysis without interfering with subsequent mobility determinations. Details of the experiments mentioned will be described in later publications.

Dr. C. B. Jones studied the keratin solubilities and Dr. Hans Lineweaver performed the papain assays.

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[1] The Carbide and Carbon Chemicals Corporation kindly furnished a generous sample.

[2] E. K. Fischer, *Jour. Biol. Chem.*, 89: 753, 1930.

[3] C. V. Smythe, *Jour. Biol. Chem.*, 114: 601, 1936.

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