MUSLIM BLOOD GROUPS WITH PARTICULAR REFERENCE TO THE U.P.

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RECENTLY blood groups of Muslims have been determined at Calcutta by Macfarlane, and Greval and Chandra. The former grouped 120 Muslims from Budge Budge (24 Parganas) and 136 urban Muslims from Calcutta, and the latter 321 mostly urban Muslims in connection with the blood transfusion service of Calcutta.

About 400 Muslim students at Lucknow have been grouped by me. The denomination Shia and Sunni were either given by the students or assigned by my Muslim colleagues. Doubtful cases were excluded. When two brothers were found to belong to the same group one of them was excluded from calculation.

The accompanying three tables give the blood groups of the Muslim students of the Lucknow University, representing the U.P. Muslims, and those of their co-religionists in other localities further east and west geographically.

TABLE I

Blood Groups of Muslims of the U.P.

	O	A	B	AB
Muslims (326) ..	34·1	23·0	33·7	9·2
Shia Muslims (106) ..	35·8	25·5	33·7	4·7
Sunni Muslims (220)	33·2	21·8	37·7	9·2

TABLE II

Blood Groups of Muslims and Their Gene Frequencies

	O+A	P	*q*	*r*	Author
(1) Turks	74·80	·256	·135	·607	Hirschfeld
(2) Arabs	72·00	·238	·151	·616	Altounyan
(3) Syrian Muslims ..	84·90	·252	·081	·669	Boyd and Boyd
(4) Tunis Muslims ..	78·88	·211	·112	·681	Caillou and Disdier
(5) Pathans	60·60	·209	·222	·541	Malone and Lahiri
(6) Hazaras	57·00	·157	·254	·566	do.
(7) U.P. Muslims ..	57·10	·177	·245	·584	Majumdar
(8) "Shias"	61·30	·165	·218	·598	do.
(9) "Sunnis"	55·00	·159	·259	·575	do.
(10) Budge Budge Mohamedans	51·60	·174	·282	·582	Macfarlane
(11) Urban Mohamedans ..	62·50	·200	·209	·572	do.
(12) Calcutta Mohamedans ..	54·10	·188	·264	·543	Greval and Chandra

TABLE III

Blood Groups (contd.)

	B + AB	O	A	B	AB	Author
(1) Turks (500)	25·20	36·80	38·00	18·60	6·60	Hirschfeld
(2) Syrian Arabs (1,149) ..	28·00	38·00	34·00	20·00	8·00	Altounyan
(3) Syrian Muslims (199) ..	15·10	44·70	40·20	11·60	3·50	Boyd and Boyd
(4) Tunis Mohamedans (500) ..	21·20	46·40	32·40	15·80	5·40	Caillou and Disdier
(5) Pathans (150)	39·40	29·30	31·30	33·30	6·10	Malone and Lahiri
(6) Hazaras (100)	43·00	32·00	25·00	39·00	4·00	do.
(7) U.P. Muslims (326) ..	42·90	34·10	23·00	33·70	9·20	Majumdar
(8) "Shias" (106)	38·70	35·80	25·50	34·00	4·70	do.
(9) "Sunnis" (200)	46·90	33·20	21·80	37·70	9·20	do.
(10) Budge Budge Mohamedans (120)	48·30	28·30	23·30	40·00	8·30	Macfarlane
(11) Urban Mohamedans (136) ..	37·50	33·10	29·40	30·90	6·60	do.
(12) Calcutta Mohamedans (321)	45·70	29·50	24·60	36·40	9·30	Greval and Chandra

Tables I, II and III do not need any explanation. A casual inspection of these figures will show how far the Muslims of India serologically stand with respect to their colleagues in other parts. The Muslims of Budge Budge (24 Pargs., Bengal) and of all Bengal (Greval and Chandra) show difference from the U.P. Muslims, both the Shias and Sunnis, the former being more remote than the latter. As we proceed from Western India to the east, the O percentage decreases from 35·80 (Shias) to 29·50 (all Bengal: Greval and Chandra), while the percentage of B increases from 33 to 40 in the case of the Muslims of Budge Budge. If we add B + AB, the Sunnis of U.P. (46·90) stand nearer to the Mohammedans of Budge Budge (48·30) as well as to those from all Bengal (45·70) though in the absence of details about distribution of the latter we do not know how far they are representative of Bengal Muslims. The Pathans, Shias and the Hazaras do not show even 40 per cent. B + AB.

The Muslims of Bengal and the depressed castes of the same area, show similar blood groups percentage (Macfarlane). The latter comprise Pod, Bagdi, Namo, Mal and Rajvanshi (75) showing 29·3 O, 22·7 A, 42·7 B and 5·3 AB. Again Macfarlane's non-caste Hindus, comprising the artisan and depressed groups (320), recorded 30·9 O, 22·2 A, 40·0 B and 6·9 AB. The large percentage of O among the Muslims of U.P. and a lower incidence of B show perhaps a higher degree of isolation or ethnic purity of the upcountry Muslims. This is corroborated by the percentage distribution of blood groups among the urban Muslims (Macfarlane) who belong to Bengal as well as to upcountry centres, more to the latter, I suppose. Again the low value for B among the Muslim population outside India and also very high incidence of A distinguish these from Indian Muslims. A critical study of the data along with those now being collected will be presented in a separate paper to be published elsewhere.

I am indebted to the authorities of the Shia Intermediate College, Christian College, Isabella Thoburn College for Girls, and Canning College.

1. Greval and Chandra, "Blood Groups of Communities in Calcutta," *Ind. J. Med. Res.*, 1940, **27**, 1109-16. 2. Macfarlane, E. W. E., "Intercaste differences in blood groups distribution in Bengal," *Abs. Proc. 25th Indian Sc. Congress*, Part III, 199–200. 3. —, "Blood-groups distribution in India with Special Reference to Bengal," *J. of Genetics*, July, 1938, **39**, No. 2, 225–37. 4. Boyd, W. & L., "Blood Groups and Inbreeding in Syria," *Am. J. Phys. Anth.*, 1941, **28**, 318ff. 5. Gates, R. R., "Recent Progress in Blood Group Investigations," *Genetica*, 1935, **18**, 47–65. 6. Majumdar, D. N., "Blood Groups of Criminal Tribes," *Science and Culture*, **8**, 334 ff. 7. —, "Blood Groups of the Doms," *Curr. Sci.*, **2**, 153–54. 8. Chatterjee, B. K., and Mitra, A. K., "Blood Group Distribution of the Bengalis and their comparison with other Indian races and caste," *Indian Culture*, **8**, No. 223, 1–21.

SUBSTITUTES IN WAR AND PEACE

ACCORDING to *Nature*, 1943, 152, 184, Doctor C. H. Desch, in a brochure entitled "Substitute materials in war and peace", invites attention to some of the less well-known facts: In the autumn of 1941, Germany was using producer-gas for running 150,000 lorries; many more were on order and also 20,000 new agricultural tractors with the same means of propulsion. In the United States, synthetic resins have become even scarcer than the aluminium they were designed to replace. An artificial fibre, made entirely from coal, limestone and chlorine, has been made in Germany since 1939; it is used for protective clothing, fishing nets and chemical filters. Some 10,000 tons of 'fodder yeast', first made on a large scale in Germany during 1914-18, was being produced at Regensburg in 1939. Nickel in the Axis countries has been largely replaced by chromium and molybdenum, obtained within occupied regions. There is no evidence that the quality of German aircraft is suffering in any way from lack of suitable alloy steels, but for steel-making there is probably a shortage of manganese, for which no satisfactory substitute is known.

In Great Britain much economy has been effected by reducing the number of steel specifications from 2,000-3,000 to 85, and further reduction is possible. Copper and 'stainless' steel for making resistant chemical plant have been economized by using mild steel with a surface-layer of the more valuable metal, rolled on to it during the manufacture of the plates. Difficulties have been encountered in finding a satisfactory substitute for tin in making tin-plate and for bearings. In the United States, plants are being constructed to produce annually 800,000 tons of synthetic rubber from petrol and 200,000 tons from alcohol, prepared from grain. Japan is said to be using her superabundance of rubber by distilling it to produce petrol. Of all substitutes now in use, synthetic resins are considered to have the greatest probability of a survival, and as mineral resources gradually decline, as they inevitably must, greater use will be made of substitutes, and particularly of those which can be produced from the renewable raw materials provided by Nature.