TABLE 2

Class	t, days	Q, per mm³./ day	P, per mm³./ day	f
Mature red cell	60	3.13×10^5	3.13×10^5	0
Reticulocyte	3.6	3.13×10^5	3.13×10^5	0
Normoblast	2.3	3.13×10^5	2.27×10^5	0.55
Erythroblast	0.35	2.27×10^5	2.18×10^5	0.084
Hemocytoblast	0.23	2.18×10^5	2.12×10^5	0.055

example, the cells of the erythrogenic tissue were 5 per cent. of the total number in the marrow, only 2 mitoses per cell per day would be required. Whether or not this development occurs in erythrogenic capillaries involves the recognition at any one time of the presence (Sabin[3]), or absence (Jordan,[4] Kindred[5]), of cell division in about one capillary endothelial cell out of 25. Such a marrow would regenerate from the depleted state in about 10 days. The difficulty which Jordan, Kindred, Duran-Jorda[6] and other investigators have experienced in finding a sufficient number of precursors to maintain the red cell population in the steady state is thus considerably reduced when the precursors are regarded as *becoming* the cells of the subsequent classes by maturation instead of as *giving rise* to the cells of subsequent classes by mitosis; it should be understood, however, that my purpose is not to try to settle the question, but to call attention to this way of approaching the problem.

The same type of calculation is applicable to the steady state of the granulocytes, but here the difficulty is to assign a value to N for the class of the polymorph, because this cell is present not only intravascularly but also extravascularly. Reasonable values, however, point to the duration of life of the various white cell precursors being longer than that of the red cell precursors.

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FLUORESCENT MICROSCOPIC STUDY OF THE PHYSIOLOGICAL DISTRIBUTION OF ATABRINE

STUDY of the pharmacology of atabrine has led to a more rational use of the drug and increased its efficiency as an anti-malarial agent. Chemical determinations have demonstrated that atabrine is localized chiefly in leucocytes, liver, spleen and kidney.[1] The study here reported has been undertaken to determine where, within the tissues, atabrine is localized, in an attempt to better understand its action on the infectious organism.

The fluorescent property of atabrine, with its maximum wave-length at 365 mμ, is utilized in its chemical determination in plasma.[2,3] The same principle is used in the microscopic study. The source of illumination is from an H-4 bulb mounted in an ordinary microscope lamp attached to the appropriate transformer. A Corning No. 5984 filter is interposed in front of the lamp and a Corning No. 3894 filter, ground down to fit the ocular, is used as the selective filter.

Fluorescent microscopy has been utilized for some time. Dempsey[4] and Dempsey and Wislocki[5] have recently used it extensively. However, these authors use ultra-violet light and quartz lenses throughout and therefore could detect true fluorescence of tissue. The fluorescence used in this study is at a wave-length of 365 mμ, which is within the range of visible light, and therefore glass lenses can be used.

Frozen sections are made from fresh tissue, or after fixation in neutral or slightly alkaline formalin, and mounted in saline or 0.2 M Na_2HPO_4. (Atabrine shows its greatest fluorescence at pH 9.5 in aqueous solutions.) No method has been perfected for making permanent mounts of these sections. The above technique is a modification of the method of Popper.[6]

Adult male and female mice were injected intraperitoneally with a 2 per cent. solution of atabrine hydrochloride, the daily dosage being 2 mg and the total dosage 4–12 mg. Uninjected mice were sacrificed and studied simultaneously with each test animal. Control tissue shows a slight amount of yellowish fluorescence which is diffuse throughout the entire section, although under the high power (440X) it is barely visible. However, the fluorescence of atabrine is of an entirely different color, being yellowish green, and has an intensity so much greater that the diffuse yellowish background is completely lost. With this method the absence of fluorescence manifests itself as a black background.

Preliminary studies revealed the greatest concentration in the liver, spleen and kidney, as has been demonstrated quantitatively by Shannon *et al.* In the liver fluorescence appeared diffusely distributed throughout the parenchymal cells. The nuclei showed no greater concentration than the cytoplasm. The sinusoids appeared black and there was no evidence of any great concentration within the Küpffer cells. In the spleen, the fluorescence appeared to be con-

[3] F. R. Sabin, *Physiol. Reviews*, 8: 191, 1928.
[4] H. E. Jordan, *Anat. Record*, 73: 227, 1939.
[5] J. E. Kindred, *Amer. Jour. Anat.*, 70–71: 207, 1942.
[6] F. Duran-Jorda, *Lancet*, 186, Aug. 14, 1943.
[7] E. Fairman and G. W. Corner, *Anat. Record*, 60: 1, 1934.
[8] G. E. Farrar, *Amer. Jour. Physiol.*, 117: 662, 1936.
[1] J. A. Shannon, *et al.*, *Jour. Pharm. and Exp. Therap.*, 81: 307, 1944.
[2] B. B. Brodie and S. Udenfriend, *Jour. Biol. Chem.*, 151: 299, 1943.
[3] J. M. Masen, *Jour. Biol. Chem.*, 148: 529, 1943.
[4] E. W. Dempsey, *Endocrin.*, 34: 27, 1944.
[5] E. W. Dempsey and G. B. Wislocki, *Endocrin.*, 35: 409, 1944.
[6] H. Popper, *Arch. Path.*, 31: 766, 1941.

centrated within the Malpighian corpuscles and there was very little within the sinusoids. This would suggest that high concentrations of atabrine were not attained within the reticulo-endothelial cells. In the kidney the convoluted tubules showed the greatest fluorescence, the collecting tubules a lesser amount, and the glomeruli but little. Fluorescence in other organs was not as great as in the three organs first described.

Further, it is not yet definitely established that this is all due to atabrine alone because no distinction can be made between atabrine and its degradation products by this technique.

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THE EFFECT OF MOTION PICTURES ON BODY TEMPERATURE

THE letter from Mr. N. Kleitman in SCIENCE for May 18 on "The Effect of Motion Pictures on Body Temperature" is of interest, in that it gives an apparent anomaly.

Although I am not a biologist, there would appear to be two possible complicating factors of which no mention is made, and it would be interesting to know whether there is any correlation in respect of these two points.

(1) It would be expected that the type of film would have an overwhelming effect on any rise in body temperature. It seems unreasonable to suppose, among the wide variety of films seen by habitués, that a similar rise in body temperature would be occasioned by widely different types of film; the figures show a similar rise in body temperature for all types of film, and one feels from this that some other factor may well be involved. The point is well put that a film need not necessarily be a relaxation and it can, of course, give rise to intense emotions, but it would have been thought that in the case of a habitué, many films would certainly not have a very intense effect.

I myself go rarely, but there appear to be a good proportion of very disappointing feature films which should affect the figures given.

(2) A possible overriding factor may be the rise in body temperature occasioned by close contact with masses of other people in a confined space. The normal diurnal temperature drop expected at the time when the habitué went to the cinema presumably occurs in conditions of uncrowded living at home. I am not sufficiently familiar with the American conditions to know if it is a reasonable assumption that the average temperature in the home of the habitué would be reasonably lower than the temperature in the cinema, but in any case, proximity to considerable numbers of other human beings is likely to have an appreciable effect on temperature.

It would be interesting to know whether any data have been taken for, say, rise in body temperature at a concert or something less stimulating, or possibly a soporific election meeting, if such are held in America.

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SUGGESTION FOR THE DISCHARGE OF SCIENTISTS FROM THE ARMED FORCES

RECENT discussion in scientific circles and journals points out that the United States faces a serious decline in the progress of scientific research for a period at least equal to the "duration," since it has placed its younger scientists of draft age in active service. Concern over this matter has been most expressed in the field of medicine and in the physical sciences because of their practical importance. The same concern should be felt and voiced with respect to those fields of pure science in which immediate importance is not evident. The several sciences interlock so completely that in the long run it is as disastrous to interrupt a train of thought dealing with quaternions or to take a research anatomist away from the study of the giant panda as it is to halt research on poison gases or their antidotes, or on stratospheric trajectories.

That the so-called pure sciences form the framework of all scientific research is so evident that we should now look from the immediate bearing to the remote bearing of our allocation of scientific personnel. A proper coverage of the sciences in the organization of our American scientific personnel becomes the more important when it is remembered that with an impoverished or ruined Europe America must shoulder a much greater share of the cultivation of the sciences than ever before.

Since, however, the temper of the country at large and likewise the temper of our most promising young scientists seem to be definitely against any general deferment of such a group of young men, however great their future importance to science and to the nation, we seem to be at an *impasse*. Finding no solution to the problem as a whole, I venture a suggestion for a segment that seems solvable. This lies in the discharge of all men now in the armed forces who are past the age of 30, below the commissioned rank and for whom a research position in a university, museum or research institute is being held open. A man below the officer rank, and past the age of 30, who holds a responsible research position in a scientific institution would obviously serve the national interest better if returned to his civilian scientific post. The performance of the tour of duty indicated by his age will remove any feeling on the man's own part (or in that of his fellows) that he has shirked a na-