Study of the problem leads me to suggest the following:

1. The entire problem should be more carefully studied by a government agency or foundation before serious shortages occur.
2. A diplomatic approach should be made to the Government of India through the United States Consulate in Calcutta, requesting their cooperation.
3. Trappers and shippers in India as well as importers in the United States should be licensed and compelled to meet certain stated requirements.
4. All Rhesus specimens leaving India should be tested for tuberculosis and the positive reactors eliminated.
5. A study should be made of the need for these primates and this demand should be coordinated throughout the year with trapping operations in India.
6. Agreements should be made with shipping lines which will handle this traffic so that they will provide shipping facilities and adjust their charges accordingly.
7. Shipments of monkeys should be accompanied by trained caretakers.
8. Shipments should be timed and routed taking into consideration the weather conditions prevailing at various times of the year and the effect on Rhesus shipments. The Red Sea should be avoided at certain seasons (after the Mediterranean is again open) and during severe winter weather, shipments could be sent to the West Coast or to Southern ports, *e.g.*, New Orleans, instead of Boston and New York.
9. An adequate balanced ration and not solely unhulled rice should be required for animals during shipment.
10. Rhesus monkeys could be purchased directly from reliable agents in India at a considerable saving to scientific laboratories.
11. Breeding colonies for a limited number of disease-free, selected, dated and conditioned specimens should be established in the United States or nearby in the Western Hemisphere.
12. Consideration should be given to the possibility of using the New World platyrrhine monkeys in experiments where they can be substituted for the Rhesus monkeys.

Assuming that a supply of Rhesus monkeys or of other *Macaca* is essential for American laboratories, some of these recommended steps would seem highly desirable if not imperative.

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MUSCA DOMESTICA AND HIPPELATES FLIES—VECTORS OF BOVINE MASTITIS

RECENT work at the Florida Agricultural Experiment Station on transmission of bovine mastitis shows that at least two species of insects, namely, the common housefly, *Musca domestica,* and frit flies or eye gnats, *Hippelates* spp. to be important vectors of the infection. Close observations made on diseased animals in affected herds showed that *M. domestica* were persistent in their feeding habits at the teat orifice of lactating cows in the milking line and of cows corralled near the barns. They fed on waste milk accidentally spilled on floors during milking operations. *Hippelates* were noted to hover around the natural body openings of calves, yearlings, pregnant heifers and lactating cows. *Hippelates* fed on lacrimal fluid, fatty body secretions, milk droplets accidentally spilled on the feet and on secretion at the tip of the teat of animals in herds where mastitis has prevailed. Structural characters, breeding habits and feeding activities of *M. domestica* and *Hippelates* flies aroused suspicion that these insects could serve as ideal vectors of mastitis.

Exposure tests were made to ascertain the possible relation these species might have to udder infection by their feeding habits at the teat orifice. The insects were taken from herds where mastitis has prevailed. In some instances alternate feedings on infected material and the teat orifice were made, while in other instances the teat orifice was exposed to insects taken directly from premises where mastitis prevailed. Mastitis developed in each of the experimental animals by the exposure technique employed. The type of udder infection, whether temporary or permanent, depended upon several factors. Active infections developed where the udder secretion was allowed to remain in the quarter as occurs naturally during the drying-off period prior to calving. Under natural conditions *M. domestica* and *Hippelates* fed simultaneously at the teat orifice of animals in corrals and many exposures were effected throughout the day during the insect season. While this work points out importance of insect transmission of bovine mastitis and opens up new fields of investigation it does not convey the idea that mastitis may not be transmitted by other means. Since *Hippelates* have previously been incriminated in the transmission of conjunctivitis and yaws (*frambоesia tropica*) in humans it would not seem unreasonable to suspect these insects serve as vectors of other infections such as Brucellosis in cattle *via* the conjunctivae, mouth, teat orifice, vagina and skin. Buchli has shown these routes to be the portals of entry of *Brucella abortus* in cattle.

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EVIDENCES OF PLEISTOCENE CURRENTS IN PENINSULAR FLORIDA

THE Aero Service Corporation in Philadelphia have recently completed, on a scale of 1:40,000, an aerial survey of the southern third of the peninsula of Florida. The photographs had been assembled on a rough mosaic basis on great boards, and matched with a remarkable degree of accuracy. Southeast of Lake Okeechobee the small lagoons were arranged along

lines of N 30 W. In the area west and northwest of Lake Okeechobee the lagoons and probably sand ridges were arranged along lines of N 45 W. Southwest and west of Miami the lines were arranged in broad sweeping curves convexed toward the east, approximating the curve of the Florida Keys.

The impression produced was very striking. The probable explanation is that this arrangement is due to currents, or currents and winds acting together during Pleistocene time, when all of this portion of Florida was covered by shallow sea.

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THE USE OF THE TERMS POLYGAMY, POLYGYNY AND POLYANDRY

THE term polygamy is frequently used as a synonym of polygyny in zoological writings. Polygamy, however, is an inclusive term, referring to the custom of having more than one mate, and includes both polygyny and polyandry. Since there is a definite meaning and a need for each of the three terms, it seems most desirable to stop the degradation of meaning and use the terms as defined in Webster's New International Dictionary, 1935:

Polygamy. The custom or practice of having a plurality of wives or husbands at the same time.

Polygyny. The mating of one male with several females, in certain animals, as fur seals.

Polyandry. The possession by a woman of more than one husband or mate at the same time.

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SCIENTIFIC BOOKS

STATISTICAL MECHANICS

The Principle of Statistical Mechanics. By RICHARD C. TOLMAN. Oxford University Press, 1939.

THIS new book of Tolman will be welcomed by every one interested in the fascinating field of statistical mechanics. Since an earlier book by Professor Tolman on the same subject, in the reviewer's opinion, remains one of the best introductory texts, one knew what to expect. The new book, however, far from being in any way a new edition of the older work, has a completely different character. Its purpose is to elucidate in detail the principles of the subject, especially in so far as they have been influenced by the development of the quantum mechanics. Except in the book of Von Neumann (which lies beyond the mathematical horizon of most physicists), this task had never been attempted. And this attempt alone makes it an important and useful book. In fact, it seems a pity that Tolman has not restricted himself to this sole task. In addition his book contains a straightforward text of the quantum mechanics (Chapter VII) and a discussion of the usual kind of applications (in Chapters X and XIV). These sections could have been omitted without loss to the main argument. They are quite satisfactory in themselves, but they are addressed, so to speak, to a different audience from that of the rest of the book.

The main part of the book may very well be compared with the famous article by P. and T. Ehrenfest in the "Enzyclopädie der Mathematischen Wissenschaften." There the principles of statistical mechanics were analyzed on the basis of the classical mechanics. Ehrenfest was able to show that many additional assumptions had to be made in order to explain the second law of thermodynamics. The clarity of his exposition has had a strong influence on the further development of the subject. And before going any further it may be said that Tolman's book reaches the same high standard of lucid and careful exposition. The two treatments of course exhibit several differences. The most important one is the difference in attitude with regard to the work of Gibbs. Ehrenfest has always held the opinion that Gibbs had only simplified and systematized the ideas of Boltzmann. Tolman, on the other hand, considers the Gibbsean concept of the canonical (and grand-canonical) ensemble as absolutely fundamental. He of course admits that for its justification one has to make certain assumptions, but he considers these as inherent to any kind of statistical approach. Furthermore, he tries to show that essentially the *same* assumption (the hypothesis of equal *a priori* probalities) has to be made in the classical as in the quantum statistics. The close analogies which exist between these two fields are very striking indeed. Tolman has emphasized these analogies by making the part of the book devoted to the classical statistics (Chapters III till VI) completely parallel to the part dealing with the quantum statistics (Chapters IX till XII). Even the wording is sometimes almost the same. Both parts culminate in the discussion of the H-theorem, which is thus given the central position it deserves.

All this surely is very illuminating. However, the reviewer must admit that the analysis of Tolman has not quite convinced him of the validity of the Gibbsean point of view, although as an old pupil of Ehrenfest, he may perhaps be prejudiced.

Since this is not the place for a detailed discussion, the reviewer will try to express in general terms his