studies, involving additions of cod liver oil to skimmed milk powder diets, there has been considerable destruction of vitamin A, which is suggestive from the work of Anderegg and Nelson[8] and from the studies of Mattill,[9] and that wheat oil acted partly as a protective mechanism against vitamin A oxidation[9] and partly as a vitamin A supplement, as indicated by the results of this investigation. That vitamin A is a limiting factor in the diet referred to from the standpoint of growth, reproduction and longevity has already been demonstrated by Sherman and MacLeod.[10]

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Phytopharmacological Reactions of Blood Serum from Leprosy, Tuberculosis and Syphilis.

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The author has called attention to the fact that by means of living plant-physiological test objects various toxins could be detected in the human blood which cannot be demonstrated by zoopharmacological methods. A marked toxicity was noted by Macht and Lubin in the blood of women at the beginning of the menstrual period.[1] Macht has demonstrated the presence of a toxin in the blood of pernicious anemia patients,[2] which led to useful clinical applications in respect to differential diagnosis and evaluation of therapeutic procedures.[3] The author, in collaboration with Pels, has shown also a toxin to be present in the blood serum and in the contents of the vesicles of patients suffering from pemphigus.[4] In the present communication, the results of an extensive study of a series of blood sera from patients suffering with tuberculosis, syphilis and leprosy, respectively, are reported.

A series of blood specimens from tuberculous patients were obtained, partly from the Tuberculosis Clinic of the Johns Hopkins

[8] Anderegg, L. T., and Nelson, V. E., *J. Ind. and Eng. Chem.*, 1925, xvii, 451.
[9] Mattill, H. A., *J. Am. Med. Assn.*, 1927, xci, 1505.
[10] Sherman, H. C., and MacLeod, F. L., *J. Am. Chem. Soc.*, 1925, xlvii, 1658.
[1] Macht and Lubin, *J. Phar. Exp. Therap.*, 1924, xxii, 413.
[2] Macht, *J. Phar. Exp. Therap.*, 1926, xxix, 461.
[3] Macht and Anderson, *J. Phar. Exp. Therap.*, 1928, xxxiv, 365.
[4] Pels and Macht, *Arch. Dermatol. and Syphilol.*, 1929, xix, 640.

Hospital and partly from the Maryland Tuberculosis Sanatorium. A phytopharmacological examination of these sera in respect to their effect on the growth of *Lupinus albus* in Shive solution, according to the usual procedure employed by the author, revealed an average phytotoxic index of 78%, which is slightly higher than that of normal human blood serum.

A series of positive syphilitic sera, showing (+++) Wassermann reaction, obtained from the Wassermann Clinic of the Johns Hopkins Hospital, gave an average phytotoxic index for syphilis of 81%. This is definitely higher than the normal phytotoxic index for human blood serum.

The author has had an opportunity of studying a series of blood serum specimens from cases of leprosy. Some of these were obtained from the National Leprosarium, Carville, Louisiana, and others from the School of Tropical Medicine, Calcutta, India, through the courtesy of Prof. R. N. Chopra. An examination of these specimens revealed that the serum of leprosy is *markedly toxic,* the average phytotoxic index for 22 specimens examined being 47%.

A study of the effects of ultraviolet irradiation on leprosy serum in quartz tubes gave a further interesting finding. It was found that, whereas the serum of pernicious anemia is detoxified by irradiation with a quartz lamp, the serum of leprosy was not at all affected by such irradiation. This is not surprising in view of the fact that leprosy is most prevalent in tropical regions and the fact that it has been found that irradiation with ultraviolet rays does not cure the disease.[5] No definite effect was noted with irradiation of sera from tuberculosis and syphilis. Attention has already been called to the fact that in case of menstrual sera the effect of ultraviolet irradiation, if any, is to render the specimen more toxic.[6] The subjoined table shows the results obtained by the author in various clinical conditions. It will be noted that the readings obtained with

TABLE I.—*Comparative Table of Blood Sera.*

Kind of Blood Serum	Average of No. of Cases	Phytotoxic Index	Effect of Ultraviolet Irradiation
		%	
Normal human	100	72	No effect
Menstrual	50	51	More toxic
Pernicious anemia	48	44	Detoxification
Pemphigus	18	54	Variable
Leprosy	22	47	Not detoxified
Tuberculosis	50	78	No change
Syphilis	50	81	No change

[5] Macht, *J. P. I. Med. Assn.*, 1928, viii, 523.

[6] Macht, PROC. SOC. EXP. BIOL. AND MED., 1927, xxiv, 966.

leprosy serum showed such a marked toxicity, as compared with the less than normal toxicity of tuberculosis and syphilis, that the phyto-pharmacological examination may be utilized to great advantage in differentiating leprosy from the other two diseases, which may simulate it.

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Action of Predigested Corpus Luteum Extract on Excised Vas Deferens.

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Macht and Matsumoto[1] called attention to the peculiar sensitiveness of smooth muscle from the excised surviving vas deferens to extracts of corpus luteum. Such extracts produce a marked contraction of the vas deferens which is exceeded only by contractions produced by epinephrin. Extracts of numerous other glands, applied to the excised surviving vas deferens in the same doses, produced only slight contractions of its smooth muscle. This peculiar selective effect of corpus luteum extract on the vas deferens is not exhibited by the follicular hormone of the ovary but is specific for the hormone of the corpus luteum. For this reason, the authors suggested its employment in the evaluation of corpus luteum products, especially as clinical experience seemed to point to a parallelism between the therapeutic potency of corpus luteum products and their degree of activity as expressed by the degree of contraction of the vas deferens.[2]

More recently Macht, Stickels and Seckinger have found that the vas deferens reaction gave results which were parallel to the inhibitory effects of corpus luteum extracts on the oestrus cycle of the guinea pig as judged by a microscopic study of vaginal smears.[3]

Inasmuch as some hormones, as epinephrin, exert their characteristic effects only on injection, while others, like thyroid glands, for instance, produce their specific therapeutic effects on oral administration as well as after injection, it was considered worth while to investigate whether the effect of digestive juices will destroy the activity of the ovarian hormones or not. This was deemed especially de-

[1] Macht and Matsumoto, PROC. SOC. EXP. BIOL. AND MED., 1919, xvi, 86.

[2] Macht and Matsumoto, *J. Urol.*, 1919, iii, 63.

[3] Macht, Stickels and Seckinger, *Am. J. Physiol.*, 1929, lxxxviii, 65.