The Protective Power of Normal Human Serum Against Pneumococcus Infection.—The protective power for mice of the serum of normal individuals was tested against infection with highly virulent strains of pneumococci of the three fixed types. The author demonstrated definite protective power (from 10 or more M.L.D. of culture) in 4 of 22 sera tested against pneumococcus Type I; in 8 of 18 sera tested against pneumococcus Type II; and in 11 of 23 sera tested against pneumococcus Type III. He found that the protective power against one type of pneumococcus was not necessarily associated with protective power against other types. Of 15 sera tested against all three fixed types, none protected definitely against all three; five sera protected against two of the three types; and eleven against one or more of the three types. Sera which protected against Type II pneumococci usually but not invariably protected also against an atypical II A strain, and vice versa. Further observations are recommended to determine the significance of this protective power, for it seems probable that it is a manifestation of one of the important defensive mechanisms in natural immunity.—P. W. Clough, Johns Hopkins Hosp. Bulletin, 35:330 (Oct.), 1924.

Agar Filtration Method.—All laboratory workers are familiar with the difficulties accompanying the usual method of filtering agar through cotton in a funnel. In order to avoid these difficulties, some laboratories, notably those of New York State, use a filtration method based on the principle of suction. Such a method is employed in the Michigan Department of Health Laboratories. The empty, covered bottles are inverted in the container of melted agar medium, the container placed in a steam sterilizer (Arnold) and, in the case of 1.5 or 2 per cent agar, left for thirty minutes at a temperature of 98° to 100° C. The container is then removed from the Arnold and the contents left undisturbed at room temperature for filtration to take place. The filtration of the agar into the bottles is usually complete within five to ten minutes after removal from the Arnold. In the filtration of a medium of higher agar content, such as 3 per cent, the heating period is extended to one hour, after which the Arnold is turned off. The medium is allowed to remain in the sterilizer for filtration, since cooling too quickly may cause partial solidification due to the high agar content before filtration is complete. It should be remembered that the vacuum in the filtration bottles is never complete and the bottles are usually found to be about two-thirds full after filtration.—P. L. Kendrick, Mich. Dept. of Health.

The Employment of Arsphenamine and Its Derivatives in the Modern Treatment of Syphilis.—Raiziss et al., in the Journal of Clinical Medicine, recognize that on the question of choice between arsphenamine and one of its derivatives there is a difference of opinion. The chief determining factor should be the chemotherapeutic index (relation of maximum tolerated dose to minimum therapeutic dose) of the particular drug employed and the manner in which this drug is clinically tolerated. On this basis, in our estimation, neoarsphenamine is to be preferred. A single dose of 0.9 gm. neoarsphenamine is generally considered the therapeutic equivalent of 0.6 gm. of arsphenamine—the latter, however, being two to three times as toxic as the former. Arsphenamine contains about
30 per cent arsenic while neoarsphenamine contains about 20 per cent. All things being equal, we believe that therapeutic agents with decreased arsenical contents are more desirable. Although comparisons of the drug effects, in parallel stages of syphilis over a given period, have indicated that neoarsphenamine necessitates generally a third again as many treatments as arsphenamine, there is this compensation: there is much less likelihood of toxic disturbance, and treatment in many cases may be prolonged—a thing admitting of more satisfactory end-results. Again, the chemotherapeutic index of neoarsphenamine—due to improvement in its manufacture—has been increasing and is considerably higher than that of arsphenamine. Thus, because the newer arsenical is less toxic and therefore less likely to produce reactions, and also because the technic of its administration is simpler, physicians throughout the world are using more neoarsphenamine than arsphenamine. There are, however, some prominent syphilographers who believe arsphenamine to be more efficient than neoarsphenamine and therefore prefer to employ it, in spite of its admittedly higher toxicity. The advantage of neoarsphenamine may therefore be summed up as follows:

1. It is a neutral compound possessing about the same hydrogen-ion concentration as the blood. Its injection into the blood stream, therefore, causes less biochemical disturbance, both in the blood and tissues, than the strongly alkaline solution of arsphenamine, the hydrogen-ion concentration of which is different from that of the blood.

2. Neoarsphenamine in the ordinary concentrations employed is not hemolytic, except in very dilute solutions or in extremely concentrated solutions, while arsphenamine is hemolytic in virtually all concentrations in which it is used.

3. Neoarsphenamine is more rapidly soluble and may be used in much greater concentration; consequently, the solution may be given in a glass syringe. Arsphenamine, on the other hand, is given from a burette by the gravity method. The preparation, too, and the technic are much less elaborate in neoarsphenamine and the possibility of error, therefore, is less.

4. Neoarsphenamine, experience demonstrates, is tolerated by the patient much better than arsphenamine. Reactions are both rarer and milder, when they do occur, and, consequently, interruption of treatment is less likely.

5. Neoarsphenamine is almost invariably preferred by the patient, since there is less pain, less trauma (finer needle), risk, reaction and time consumed.

The newer methods of treating syphilis have been employed but little more than a decade. Sufficient time has not elapsed for the development of a crystallized therapeutic program acceptable to the great majority of syphilographers. The selection of the remedy, the dosage, the frequency of administration, the number of treatments in a course, the number of courses, etc., are all matters determined by the physician for himself. Certain general propositions, however, have been suggested by those who have had the widest experience in the treatment of syphilis.


Bacteriology from the Point of View of the German Patent Right.—In a lecture "Bakteriologie und Patentrecht" by Dr. Fritz Warschauer, Berlin, Patent Agent, delivered at the recent meeting of German scientists and physicians at Innsbruck, bacteriology has been, for the first time, discussed minutely from the point of view of the German patent right. The lecturer showed numerous instances where the German Reichs-Patentamt has, in acknowledging a justified claim, granted patents for bacteriological process. According to former decisions an invention was considered to be patentable in Germany only if it related to mechanical or chemical treatment or working up of raw materials, viz., if by technical means a technical effect was obtained. In practice, the Reichs-Patentamt has, however, given up this antiquated notion, probably in consideration of the development of bacteriologic science, and by a recent decision it has expressly acknowledged that processes and methods which utilize the vital proceedings of nature are patentable. A list compiled by the lecturer showed that many famous scientists and leading chemical factories are inventors and proprietors of the bacteriological patents.—Personal Communication.
A Modification of Albert’s Stain for the Diphtheria Bacillus.—The formulas for the modified stain are:

**SOLUTION 1**
- Toluidin blue ................. 0.15 gm.
- Malachite green .............. 0.20 gm.
- Glacial acetic acid ........... 1 c.c.
- Ninety-five per cent alcohol ... 2 c.c.
- Distilled water .............. 100 c.c.

The solution should stand twenty-four hours, and is then ready for use after filtering.

**SOLUTION 2**
- Iodin .......................... 2 gm
- Potassium iodid ............... 3 gm
- Distilled water .............. 300 c.c

STAINING TECHNIC
1. Smears are made and fixed by heat in the usual manner.
2. Solution 1 is applied for from three to five minutes.
3. The slide is washed with water.
4. Solution 2 is applied for one minute.
5. The slide is washed with water.
6. It is blotted dry with filter paper.


Note: Each month we desire to publish in the Laboratory Notes two or three short articles (not exceeding 250 words) dealing with some phase of applied bacteriology, labor saving devices, modified methods, etc. Contributions should be in the hands of the associate editor before the fifteenth of each month.—C. C. Young.

**VITAL STATISTICS**

**LOUIS I. DUBLIN, PH.D.**

**Health Record for August 1924.**—The death rate among the industrial populations of the United States and Canada during August, 1924, was the best ever recorded in any year for that month. The rate was 7.3 per 1,000, and shows a decline of 13 per cent, as compared with the figure for the same month of 1923, 8.4. The figure for July, 1924, was also 8.4 per 1,000. The general death rate for the large cities of the United States in August was 10.5 per 1,000 which may be compared with 10.6 for August, 1923, and with 10.9 for July, 1924. There was an increase in the number of reported cases of smallpox, whooping cough and poliomyelitis as compared with August, 1923, but there was less diphtheria, influenza, measles, malaria, scarlet fever and typhoid. Comparison with the reports for July, 1924, show more malaria, poliomyelitis and typhoid, but less diphtheria, influenza, measles, scarlet fever, smallpox and whooping cough.—*Statistical Bulletin*, Met. Life Ins. Co., Sept., 1924.

**Smallpox in American and Canadian Cities.**
—The number of cases of smallpox for 678 cities of the United States and Canada was 18,811 for the first six months of 1924, as compared with 7,170 in the same cities for the first six months of 1923 and 7,355 for 1922. The number of deaths per 100 cases was 1.3 in 1924, 0.8 in 1923 and 3.1 in 1922. Smallpox was especially virulent in Canada where the fatality rate for 78 cities was 30 in 1924, as compared with 0.3 in 1923 and 0 in 1922. Detroit, Windsor, Pittsburgh and New Britain showed the highest fatality rates.—*Statistical Bulletin*, Met. Life Ins. Co., Sept., 1924.

**Homicide Mortality.**—Among white policyholders of the Metropolitan Life Insurance Company, Industrial Department, in 1923 the homicide death rate was 3.5 per 100,000, while the death rate of the colored policyholders was 35.8. In certain states, however (Missouri, Nebraska, West Virginia, Kentucky and Oklahoma), the homicide rates for colored persons were above 50 per 100,000. In Rhode Island the colored rate was 8.1, in New Jersey 8.8, in Virginia 10.3 and in Maryland 12.6. Among white policyholders high rates were recorded during 1923 in Colorado (19.2), Georgia (11.8), Missouri (11.4), Arkansas (11.2), and Tennessee (11.1). The Canadian experience was very favorable (4 deaths per 100,000).—*Statistical Bulletin*, Met. Life Ins. Co., Sept., 1924.