microscope slides which were kept in moist chambers in the various incubators. One slide bearing two drops of the conidial suspension was removed from each incubator at definite intervals and the percentage of germination and length of germ-tubes in each drop noted. Two difficulties were encountered in these studies. First, the continued germination of the conidia and elongation of the germ-tubes after the slides were removed from the incubators resulted in considerable error in the last drops of each group that were examined. Second, the conidia were hyaline and therefore difficult to see. Because of these difficulties an attempt was made to find a means of killing the conidia promptly when they were removed from the incubators and to find a stain that would make them more readily visible. Of the several fungicides and stains tested, iodine-potassium-iodide was found to be the most satisfactory because it served for both purposes and in addition differentiated between the germinated and ungerminated conidia.

In practise, one drop of the iodine-potassium-iodide solution was added to each drop of spores as soon as they were taken from the incubator. This almost instantly killed the conidia and stained the ungerminated ones a golden brown color. The germ-tubes of the recently germinated conidia were also stained golden brown, but the empty spore cases remained colorless. In the more advanced stages of germination the germ-tubes did not stain at all or only at the tip.

The differential property of the stain appears to be due to the fact that it stains only the protoplasm of the conidium and not the conidial or germ-tube wall. The protoplasm of the germinating conidium migrates into the germ-tube and is eventually consumed during its growth. Therefore, the germinated conidia are stained only in the germ-tube or not at all.

Iodine-potassium-iodide was used with equally good results in studying the germination of conidia of *Peronospora parasitica*. It was also used as a stain for fresh conidia of *Peronospora lami* and *Plasmopara gerani* and dried specimens of *Peronospora destructor, Bremia lactucae, Basidiophora kellermani* and *Albugo candida*.

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AN IMPROVED METHOD OF DIRECT SMEAR EXAMINATION FOR ACID-FAST BACILLI IN SPUTUMS[1]

THE routine method of examining sputums for acid-fast bacilli by taking a loopful of the sputum from the sputum jar frequently gives negative results when the number of tubercle bacilli in the sputum is comparatively small. Concentration of a fairly large amount of sputum is usually resorted to in such cases in order to obtain a positive result. But this is time-consuming and therefore not practicable where a large number of specimens are examined.

We found in connection with another investigation that by carefully selecting the material and thorough examination of the smears, we were able to obtain the same results on the direct examination of the sputum as after concentration. The method employed was as follows:

DIRECT SMEAR EXAMINATION

The sputum was poured into a petri dish and was examined for mucus flakes. If the sputum was fluid, the flakes were collected by means of a pipette and were expelled on two chemically clean, new slides making fairly thick smears. If the sputum was very mucoid, a heavy wire loop was used instead of a pipette. The smears were allowed to dry in the air and were then stained by a slightly modified Ziehl-Neelsen method, in which the counterstain was 1–1000 dilution of brilliant green instead of methylene blue. Both smears were thoroughly examined for acid-fast bacilli with the aid of a mechanical stage.

When the result was negative on the direct examination, the sputum was concentrated in the following manner.

CONCENTRATION OF SPUTUM

The sputum was pipetted into chemically clean 50 cc centrifuge tubes, which contained glass beads. An equal amount of 3 per cent. NaOH was added, the tube was stoppered with a sterile solid rubber stopper and, after vigorous shaking by hand, it was incubated at 37° C. for from 30 to 45 minutes. The tube was shaken every 5 minutes during incubation to prevent sedimentation. The mixture was then centrifuged at high speed for one hour and the sediment again examined for acid-fast bacilli.

We examined in this manner 369 specimens from 268 suspected and definite cases of tuberculosis, and in each instance the result on the direct smear examination of the unconcentrated sputums was identical with that obtained after concentration. In no instance was a positive result obtained after concentration when it was found negative on the direct smear.

It would therefore seem that by carefully selecting the material and thorough examination of the smears,

[1] From the Bureau of Laboratories, New York City Department of Health, under the direction of Dr. William H. Park.

more positive results may be obtained on routine examination without resorting to concentration of sputums.

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AN OVER-COMPLEX APPARATUS

THE ingenious device described by J. H. Wales in SCIENCE for June 15 (79: 7059, 545) for obtaining a constant flow of liquid from a vessel by means of a siphon float appears to involve a fallacious complexity. It is inferred that by floating an inner container A, in an outer vessel of liquid, the level of the liquid in A will remain at a nearly constant point because the inner vessel with its contents rises by flotation as the liquid in it is siphoned off. This is scarcely a true picture. As the vessel A rises from loss of contents the level in B falls, and since the level in B always remains at a given height above the level of A the two levels will sink together. Any uniformity the system may have, therefore, is strictly dependent on the level in B, which is lowered in direct proportion to the volume of liquid removed. If the same liquid is used in each vessel, and if cost, restricted quantity or other limitation on the liquid in A need not be considered, where then is the advantage of the inner vessel? Exactly the same result would be attained if the float siphon were placed directly in B and A discarded altogether.

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SPECIAL ARTICLES

ON A SELECTIVE GAMETOGENIC EFFECT OF CERTAIN HYPOPHYSEAL EXTRACTS

IT has been well established that the structure and function of the testis, both as regards its production of germ cells and of its internal secretion, rapidly degenerate after removal of the anterior hypophysis and that both functions are restored by the administration of implants or extracts of anterior hypophyseal substance. It is of special interest that, depending on their method of preparation, extracts of hypophyseal substance can be made which have relatively much more influence on the germinal than on the internally secreting mechanism of the testis.

The hypophyseal extracts here reported were those employed in another series of experiments for their synergic properties when added in vitro to pregnancy-prolan. By their use it was possible to markedly increase the limited effects of prolan on normal immature females and to bring about the development of the ovary and ovulation in hypophysectomized females. These preparations were forty per cent. alcoholic extracts of desiccated anterior pituitary tissue, or trypsin-erepsin digests of such extracts. They maintained the germinal epithelium of the testis of hypophysectomized rats and, moreover, caused its repair after the profound regression encountered forty days after hypophysectomy, without effect on the internally secreting mechanism as mirrored by infantile seminal vesicles. Indeed, our results, which are to be published in detail elsewhere, show that the testis may increase threefold in weight though the seminal vesicles remain completely atrophic. In contrast to these results, the predominating effect of other gonadotropic preparations, whether from hypophysis, pregnant mares' serum, pregnant human serum, urine or placenta, is on the internally secreting component of the testis—usually considered to be the Leydig tissue.

Entirely independently of these studies, Smith, Engle and Tyndale have recently shown that the substance in menopause urine, like the hypophyseal extracts here reported, differs from the substance in pregnancy urine in its stimulating effect on the germinal rather than on the interstitial testicular tissue, and by the combination of the substance in menopause with that in pregnancy urine Smith and Engle have also secured synergic effects in hypophysectomized females.

The possibility of preparing hypophyseal extracts which effect selectively the seminiferous epithelium, as does the substance in menopause urine, furnishes presumptive evidence of an underlying chemical similarity if not identity of the two substances and of a true hypophyseal origin of the menopause hormone.

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A NEW TYPE OF FEVER AGENT

THE increasing use of artificial fever in various diseased conditions is arousing interest in the production of fever by chemical means. In some cases, such as general paresis and some chronic infections, pyretic drugs owe their possible value to the temperature increase; in other conditions, such as obesity and perhaps psychic apathy, improvement may be ascribed to metabolic stimulation.

Fever results from metabolic increase under two